



**First Responder Network Authority (FirstNet)
Data Collection and Analysis – 2016**

Submitted September 2016 to:

First Responder Network Authority

12201 Sunrise Valley Drive
Mail Stop 243
Reston, Virginia 20192



Michigan Department of Technology, Management and Budget – David Behen, Director
Lewis Cass Building, 2nd Floor, 320 S. Walnut St., P.O. Box 30026, Lansing, MI 48909



TABLE OF CONTENTS

EXECUTIVE SUMMARY.....	2
1. METHODOLOGY.....	4
2. FINDINGS	5
2.1. Coverage Objectives	5
2.1.1. LMR Coverage	7
2.1.2. State Coverage Requirements	12
2.2. Users and Operational Areas	17
2.2.1. Agency Disciplines, Number of Employees and Devices.....	17
2.2.2. Eligible Users.....	26
2.2.3. Quality of Service/Priority and Preemption (QPP).....	29
2.2.4. Site Hardening	30
2.2.5. Customer Care	30
2.2.6. Device Ecosystem	31
2.3. Capacity Planning	32
2.3.1. Number of Devices.....	32
2.3.2. Data Applications	41
2.3.3. Multiple Service Providers	66
2.4. Current Procurement	68
2.5. Phased Deployment.....	78
2.6. Barriers	80
3. RECOMMENDATIONS	85
3.1. Coverage Objectives	85
3.2. Users and Operational Areas.....	85
3.3. Capacity Objectives.....	86
3.4. Current Procurement	86
3.5. Phased Deployment.....	86
3.6. Barriers	86
4. APPENDIX I – LOCALLY IDENTIFIED COVERAGE AREAS	87



EXECUTIVE SUMMARY

On March 23, 2015, Michigan's single point of contact (SPOC), David Behen, received formal notice that the First Responder Network Authority (FirstNet) was prepared to take the next steps in the data collection process to further advance the design, development, and deployment of the Nationwide Public Safety Broadband Network (NPSBN). It was stated in this notice that the finalized data collection elements would be used in the development of its Request for Proposal (RFP) and in Michigan's State Plan. This data would be used to ensure that the network would meet the needs of Michigan's public safety community. The Michigan Public Safety Broadband team submitted a comprehensive data package to FirstNet in September 2015 that contained representative sampling from across the Michigan public safety community. The data served to identify and focus on the requirements Michigan has formulated for the NPSBN.

In accordance with the guidance and direction provided by FirstNet, data pertaining to the following subject areas was collected and submitted:

1. **Coverage:** Identify desired coverage within the state or territory and proposed build out phases.
2. **Users and Operational Areas:** Gather information on the eligible user base and their respective operational areas.
3. **Capacity Planning:** Estimate current data usage today from typical users with indicators of potential growth.
4. **Current Providers/Procurement:** Identify current service providers and plans, procurement vehicles, and barriers to adoption.
5. **State Plan Decision Process:** Document the final state plan review process prior to submission to the Governor and any potential barriers/issues FirstNet should be aware of.

The Michigan Public Safety Data Collection and Analysis Report was developed by members of the Michigan Public Safety Broadband (MiPSB) team, Consolidated Telecom Services (CTS), and Mission Critical Partners, Inc. (MCP). The information provided in the document was collected through multiple methods such as surveys, face-to-face meetings, and personal contact with Michigan's public safety stakeholder community.

In January 2016, FirstNet released a request for proposals (RFP) seeking a nationwide partner for the construction and operation of the NPSBN. Responses to the RFP were due in May 2016. As of the date of this report, three entities have publicly acknowledged submitting a response to the RFP: Rivada Mercury; AT&T; and Code 3 Broadband. The data collected and submitted in September 2015 was made available to all RFP respondents for formulation of their state deployment plans as part of their RFP responses. The RFP responses currently are being evaluated by FirstNet, with a contract award anticipated in early November 2016.

In early 2016, FirstNet announced that it would accept an additional submission of data if states wanted to participate in another collection effort. The new data submission is due September 30, 2016, and will not be used in any regard concerning the responses to the FirstNet RFP. Instead, this effort may be used by FirstNet's selected partner to further refine state plans, if deemed fiscally viable. The MiPSB team elected to



engage in this supplemental data-collection effort in an attempt to further identify and refine Michigan's NPSBN requirements.

In 2015, two separate surveys were used for data collection. The first survey of 2015 was modeled after the survey contained in the mobile data survey tool (MDST) on the Interoperable Communications Technical Assistance Program (ICTAP) website, designed by the Office of Emergency Communications (OEC) of the U.S. Department of Homeland Security (DHS). The second survey of 2015 contained supplemental questions concerning coverage priorities, local requirements, and current levels of land mobile radio (LMR) coverage. Those same two surveys were used for the data collection effort in 2016. This report contains the results of the 2016 data collection effort. There were 16 additional submissions to the MDST survey in 2016, and there were eight additional submissions to the supplemental survey. In addition to this document, the raw data also will be submitted to FirstNet in the form of Microsoft Excel spreadsheets.

The data is reflected predominantly in the form of charts and graphs for ease of reading and interpretation. In order to provide context concerning 2016 data collection efforts as compared to 2015 efforts, the data elements are depicted with three charts each. The first chart depicting a particular data element reflects just the data submitted in 2015. The next chart reflects just the additional data submissions in 2016, and the third chart reflects the total submissions for 2015 and 2016.

The data collected serves to provide greater clarity regarding issues concerning the number of devices currently deployed, current wireless services and costs, current barriers to implementation, application usage and applications desired, and current procurement methods. The data did not significantly alter the requirements of the Michigan public safety community in terms of network deployment priorities. Survey respondents still give the highest priority to coverage for critical infrastructure and major highways, and the MiPSB team still prioritizes rural coverage, water coverage, international border crossings, and urban coverage, in priority order.



1. METHODOLOGY

The MiPSB team and MCP utilized multiple methods to collect the requested data elements. The team worked very closely with the Michigan Public Safety Broadband Workgroup, a sub-working group to the Michigan Public Safety Communication Interoperability Board (MPSCIB), for assistance in outreach and establishing contact lists, as well as for making the significant decisions involved for items such as the phased construction plan. Contacts were established utilizing lists from public safety events from across the state. The vast majority of information requests were disseminated electronically to agencies.

Data collection efforts in 2016 were conducted utilizing the same two electronic surveys as were used in 2015. One survey contained questions which were contained in the mobile data survey tool as developed by the Office of Emergency Communications. The other survey consisted of supplemental questions related to phased deployment priorities, current coverage levels, coverage objectives, and current data usage. None of the agencies submitted current data usage information.

Additionally, a request for “calls for service” (CFS) location data was sent to the PSAP directors. CFS responses were received from 50 agencies in the 2015 data submission. The CFS data was converted to a Geographic Information System (GIS) format and was integrated with additional GIS data layers to be compared with the FirstNet Coverage Objective Baseline GIS layer package provided to Michigan on May 8, 2015. No additional CFS submissions were received for the 2016 data-collection effort.

Michigan conducted 8 regional planning workshops in the winter and spring of 2016. The workshops were attended by public safety representatives within the counties of each individual region. The attendees were given a presentation to educate them on the NPSBN, and then they were requested to provide feedback concerning local requirements. That feedback has been captured in this report.

The survey results are addressed in the following sections in the context of the FirstNet data categories of coverage objectives, users and operational areas, capacity planning, and current usage and procurement methods.



2. FINDINGS

2.1. COVERAGE OBJECTIVES

This image is FirstNet's base coverage objectives map for Michigan (Figure 1). Areas in white are places where FirstNet has determined will be the lowest priority for coverage based upon factors they considered, such as population, infrastructure, etc. These areas may or may not receive terrestrial based coverage depending on how the final plan is developed. The State's data-gathering efforts focused on identifying areas in white where user needs necessitate a more prioritized deployment for FirstNet based on critical infrastructure, seasonal populations, special-event locations, or other locations that may not have been considered based on the data available to FirstNet.

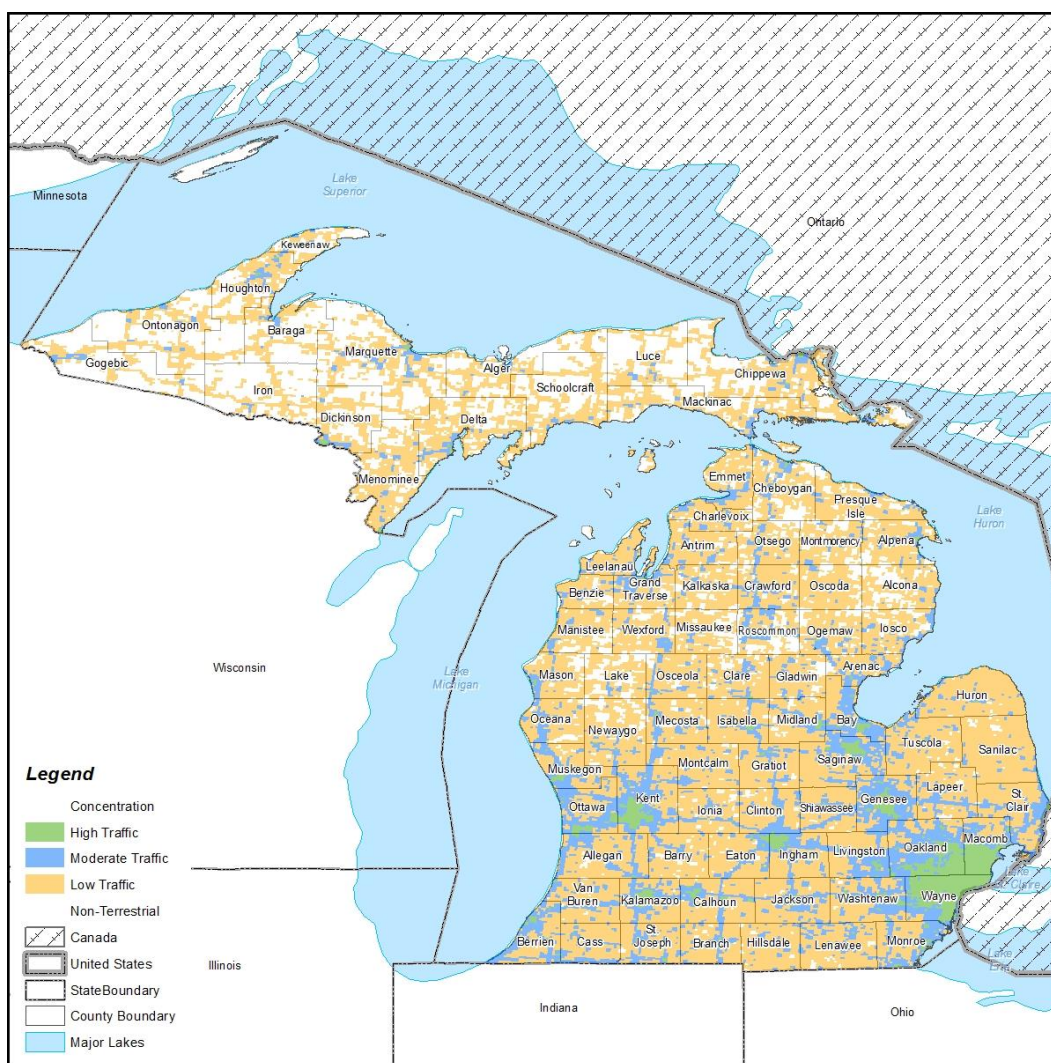


Figure 1: FirstNet Preliminary Coverage Objectives for Michigan



Survey respondents and attendees at the regional workshops were asked to provide information concerning local areas that would require coverage beyond what is indicated in the FirstNet map. Several agencies provided responses which are contained in Appendix I. The images were submitted by local officials and are included for further discussion regarding NPSBN coverage as the Michigan plan is developed.

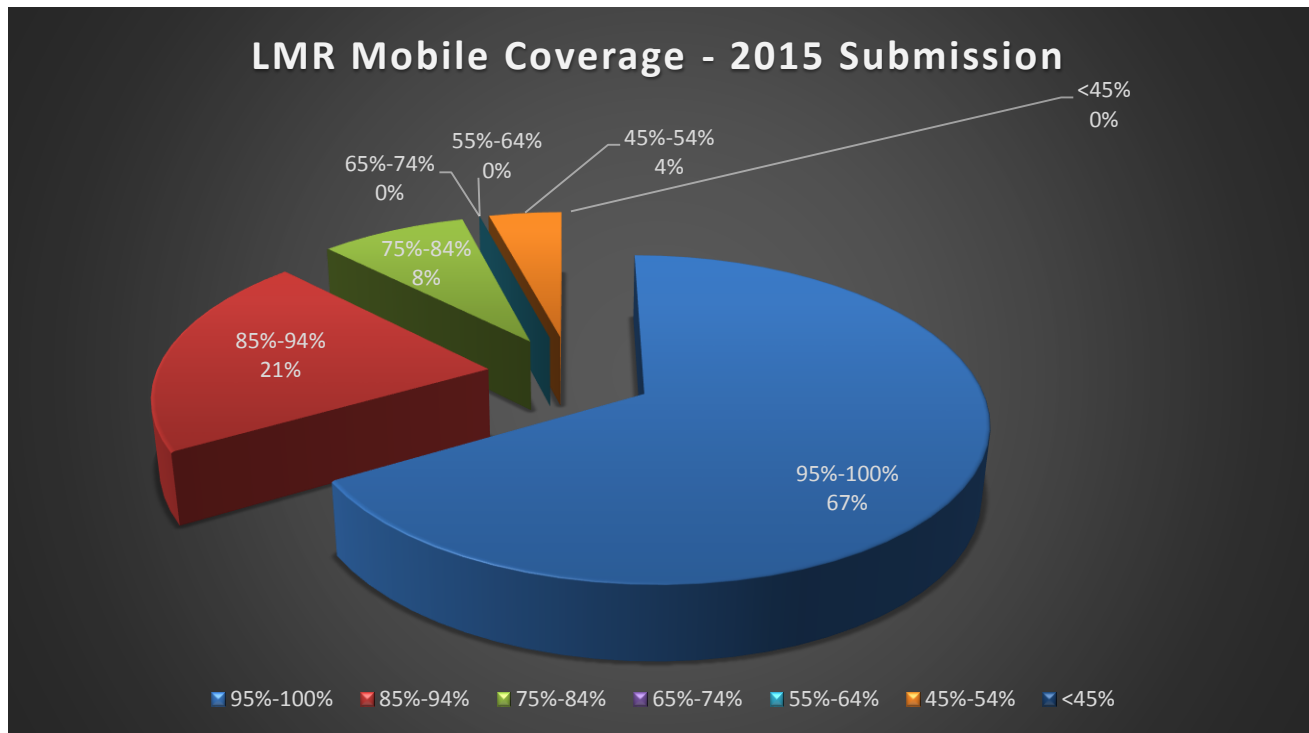
In addition to coverage objectives, information was collected concerning current land mobile radio (LMR) coverage levels as experienced by users. The new responses received in 2016 revealed that 67 percent indicated that they currently have 95 percent or better mobile coverage on their LMR system, while 88 percent indicated 85 percent or better mobile coverage. Outdoor portable coverage responses revealed that 46 percent of respondents have 95 percent or better coverage, with a total of 88 percent of respondents indicating 75 percent or better outdoor portable coverage. The last level reported concerned indoor portable coverage, with 70 percent of respondents indicating 75 percent or better coverage levels. Refer to charts in Section 2.1.1.

Remainder of Page Intentionally Left Blank



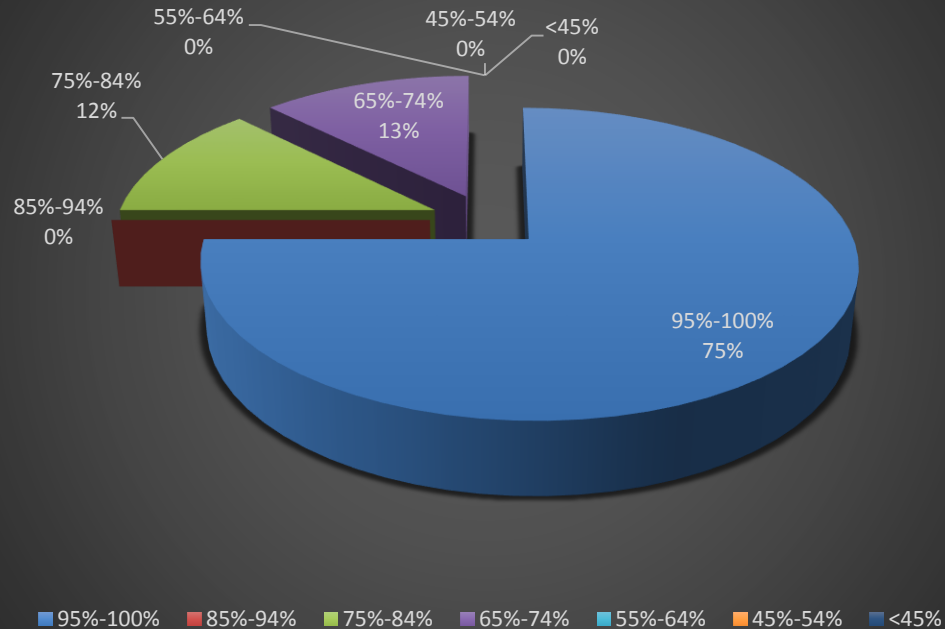
2.1.1. LMR Coverage

In addition to the coverage objectives data listed above, the supplemental survey sent to agencies asked for an estimation of the current coverage level they receive from their LMR systems. Many agencies feel that they should receive equal or greater coverage from the NPSBN. Agencies were asked to provide current coverage levels for mobile, portable outdoor, and portable indoor. The charts below depict the submissions from 2015, new submissions in 2016, and total submissions for both years:

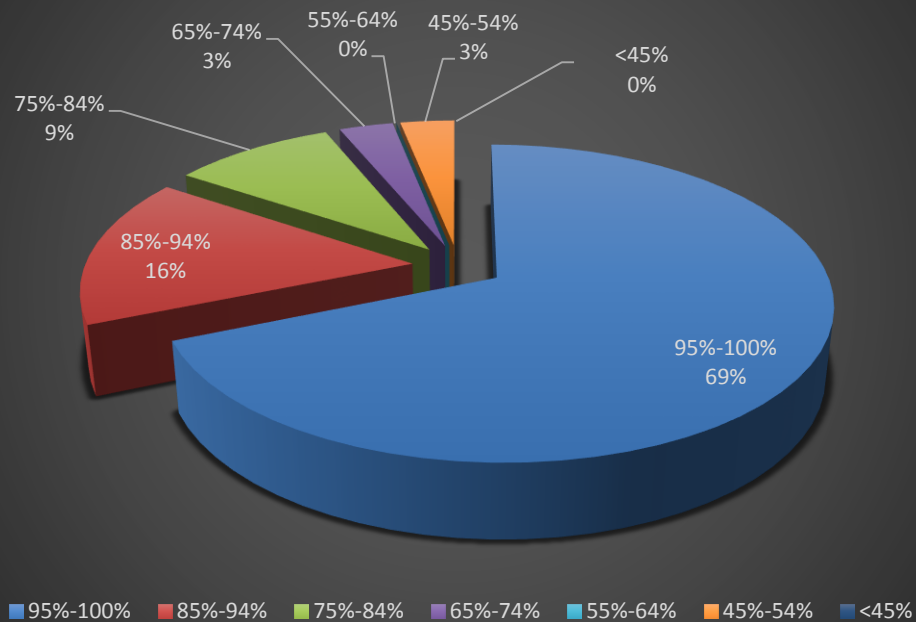


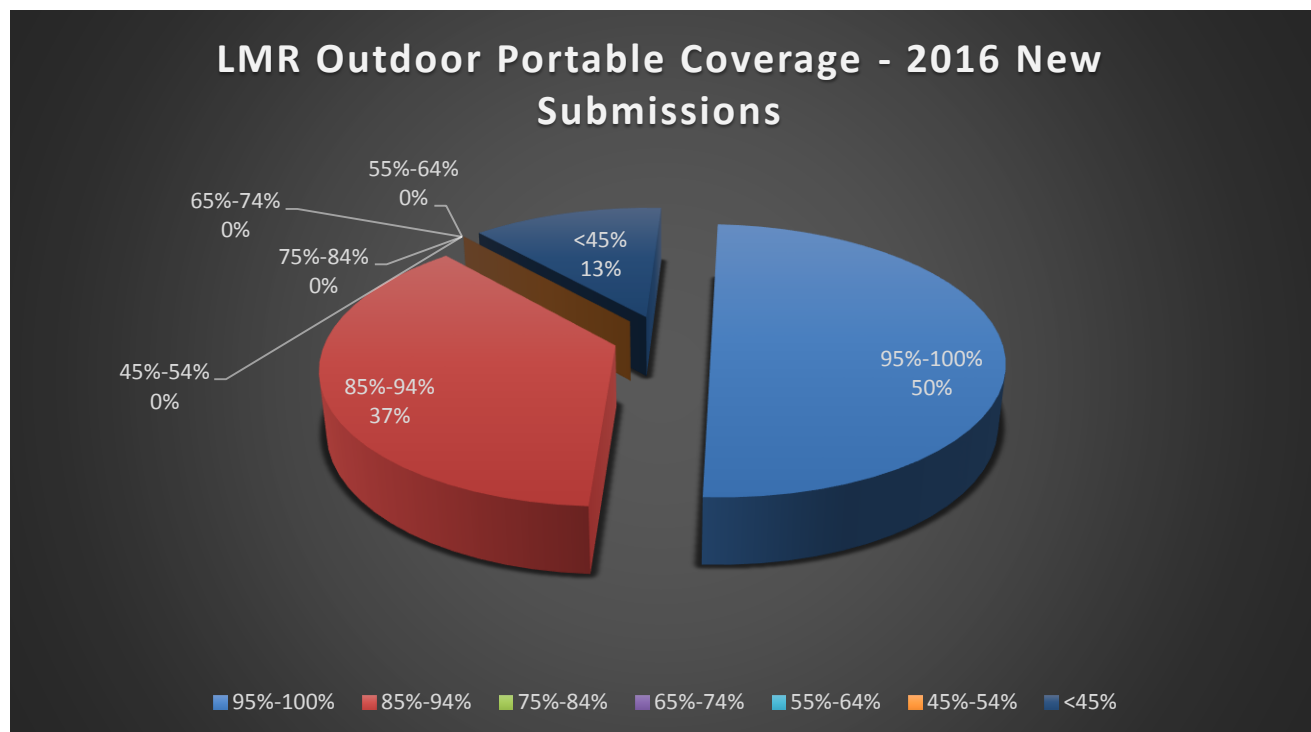
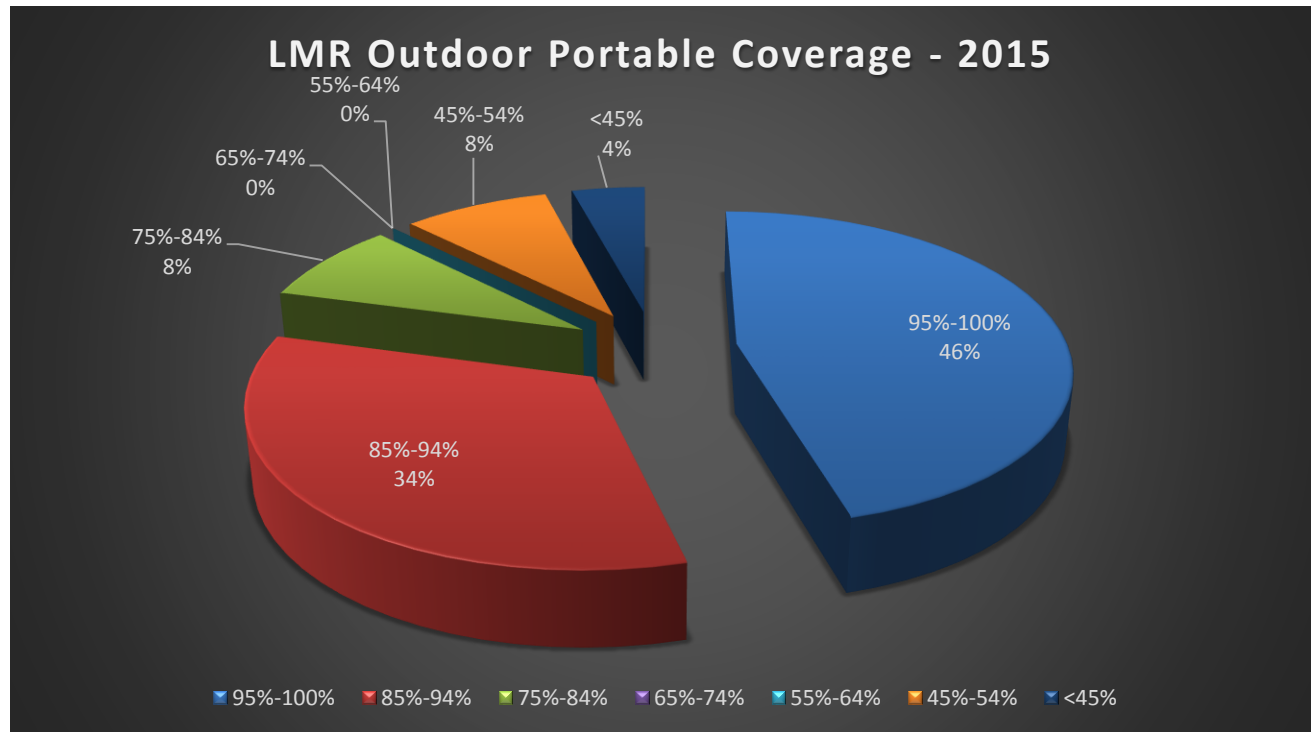


LMR Mobile Coverage - 2016 New Submissions



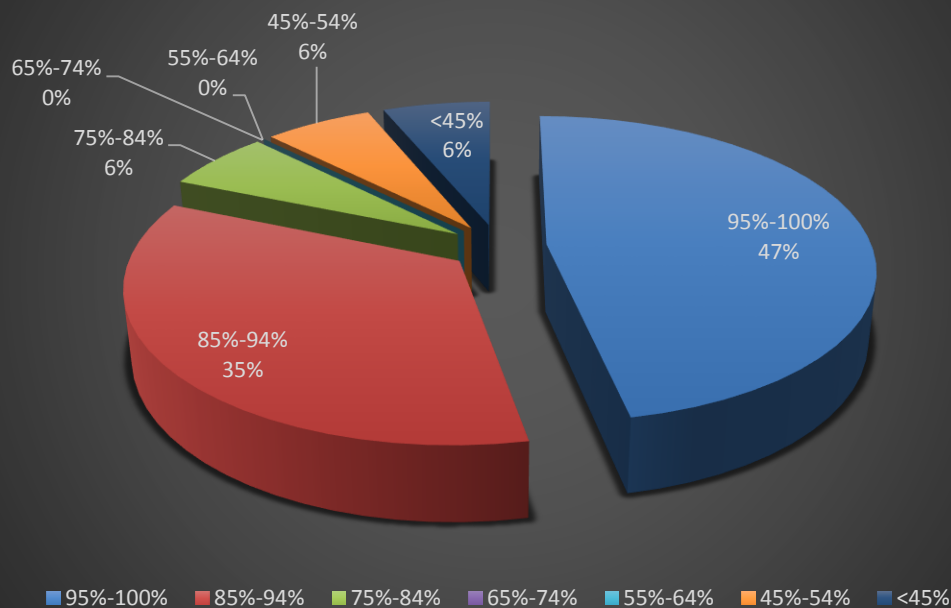
LMR Mobile Coverage - All Agencies



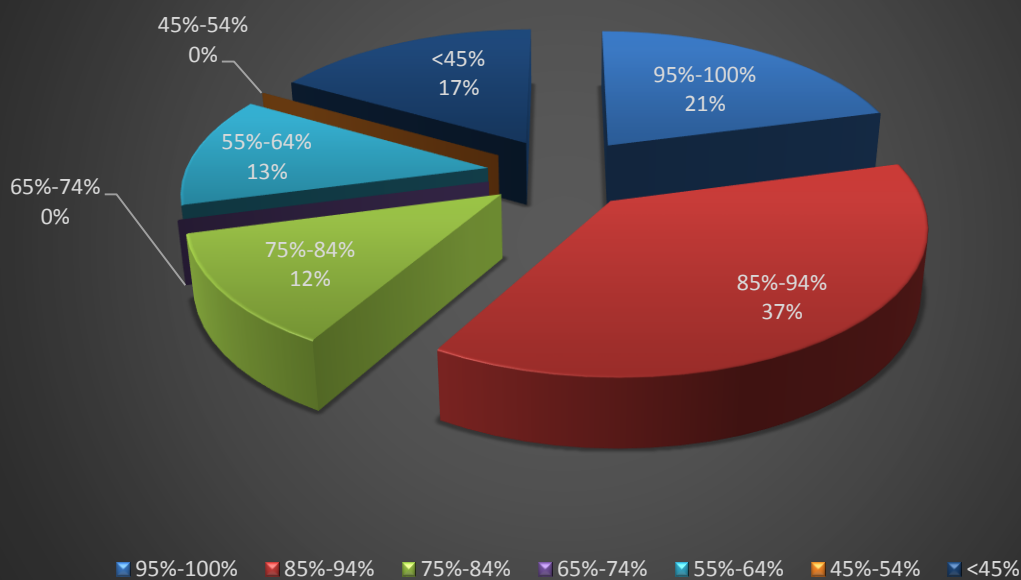




LMR Outdoor Portable Coverage - All Agencies

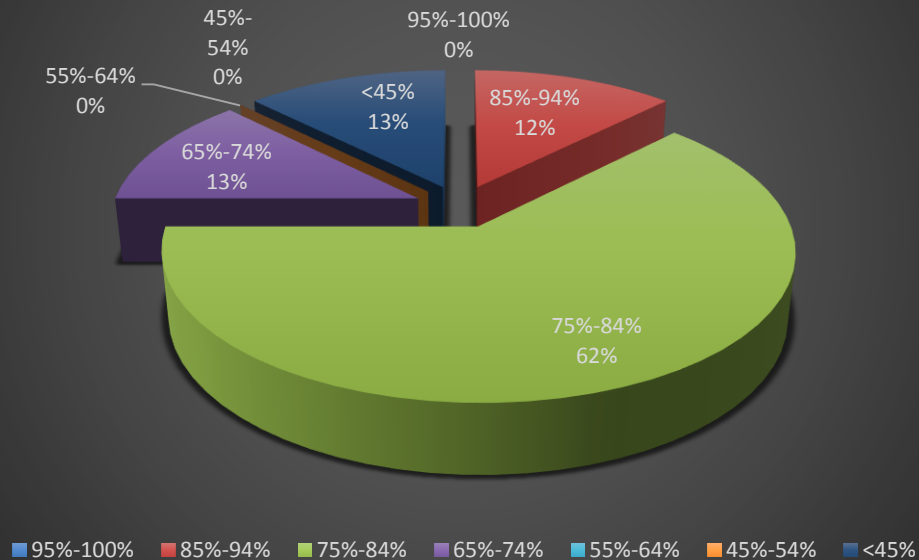


LMR Indoor Portable Coverage - 2015

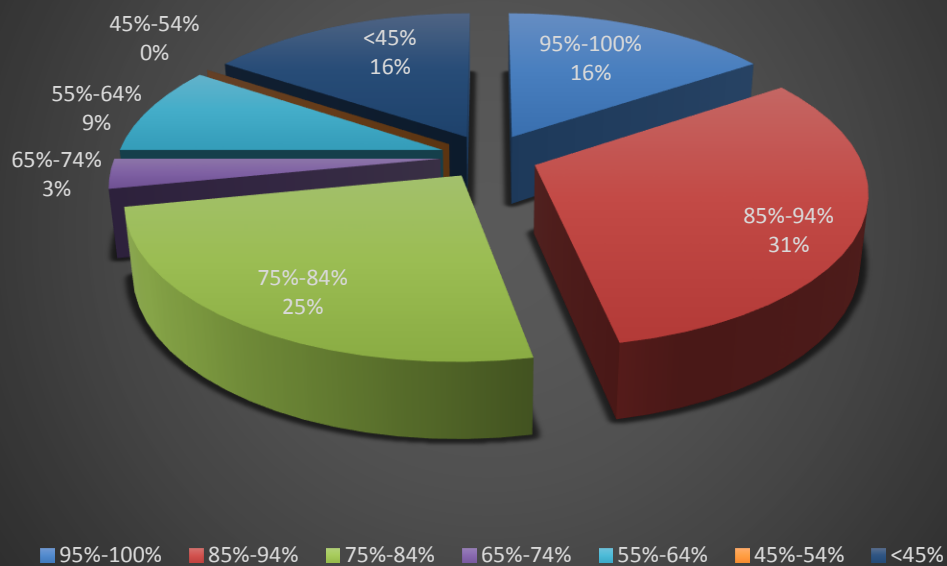




LMR Indoor Portable Coverage - 2016 New Submissions



LMR Indoor Portable Coverage - All Agencies





2.1.2. State Coverage Requirements

2.1.2.1. Rural Areas

The MiPSB team and governance body shared its belief that the NPSBN initially should supplement the coverage currently provided by commercial wireless carriers. The rationale is that broadband coverage is needed currently in areas not served, or underserved, by commercial carriers, rather than in areas where such service is already available.

2.1.2.2. Water Coverage

Michigan has the second longest shoreline of any state at 3,126 miles, one that touches four of the Great Lakes: Lake Erie, Lake Michigan, Lake Huron, and Lake Superior. The shoreline also includes 721 miles of international border with Canada. There are 11,037 other lakes in Michigan totaling 1,305 square miles of inland water. No point in Michigan is more than six miles from an inland lake or more than 85 miles from one of the Great Lakes. The amount of water in and around the state creates significant challenges for the public safety community, and comprises a priority area for NPSBN coverage.

2.1.2.3. International Border Crossings

Michigan has four border crossings/points of entry between Canada and the U.S.: Sault Ste. Marie International Bridge in Chippewa County of the Upper Peninsula; Blue Water Bridge in Port Huron, St. Clair County, in the southeast area of the Lower Peninsula; Detroit-Windsor Tunnel in Detroit; and the Ambassador Bridge, also in Detroit. These crossings present unique public safety and domestic security issues that would benefit greatly from NPSBN coverage. The table below, depicting data from 2014 obtained from the U.S. Department of Transportation, indicates that three of the four Michigan border crossings rank in the top 20 busiest crossings in the country for truck traffic.

Top Ports Border Crossing By Number of Trucks

TOP PORTS OF BORDER CROSSING/ENTRY (YEARLY) RANKED BY NUMBER OF TRUCKS				
RANK	PORT NAME	TRUCKS	PORT CODE	YEAR
1	MI: DETROIT	1,554,152	3801	2014
2	NY: BUFFALO-NIAGARA FALLS	962,076	901	2014
3	MI: PORT HURON	778,268	3802	2014
4	WA: BLAINE	367,994	3004	2014
5	NY: CHAMPLAIN-ROUSES PT.	285,195	712	2014
6	ND: PEMBINA	229,079	3401	2014
7	NY: ALEXANDRIA BAY/Cape Vincent	192,551	708	2014
8	WA: SUMAS	149,361	3009	2014
9	MT: SWEETGRASS	145,803	3310	2014



TOP PORTS OF BORDER CROSSING/ENTRY (YEARLY) RANKED BY NUMBER OF TRUCKS				
RANK	PORT NAME	TRUCKS	PORT CODE	YEAR
10	ND: PORTAL	98,872	3403	2014
11	VT: DERBY LINE	97,836	209	2014
12	VT: HIGHGATE SPRINGS	93,914	212	2014
13	ME: JACKMAN	84,755	104	2014
14	ME: HOULTON	84,043	106	2014
15	ID: EASTPORT	63,944	3302	2014
16	ME: CALAIS	62,352	115	2014
17	WA: LYNDEN	41,580	3023	2014
18	MI: SAULT STE. MARIE	38,932	3803	2014
19	NY: OGDENSBURG	37,726	701	2014
20	WA: OROVILLE	30,981	3019	2014
21	ND: DUNSEITH	28,619	3422	2014
22	NY: MASSENA	23,188	704	2014
23	MT: RAYMOND	19,511	3301	2014
24	ME: MADAWASKA	19,238	109	2014
25	WA: FRONTIER	18,294	3020	2014
26	WA: POINT ROBERTS	18,121	3017	2014
27	MN: INTERNATIONAL FALLS	16,528	3604	2014
28	MN: GRAND PORTAGE	16,460	3613	2014
29	ME: VAN BUREN	16,053	108	2014
30	ND: WALHALLA	14,413	3407	2014
31	ME: FORT FAIRFIELD	14,217	107	2014
32	NY: TROUT RIVER/FORT COVINGTON/CHATEAUGAY	13,707	715	2014
33	ND: NORTHGATE	11,316	3406	2014
34	VT: NORTON	11,161	211	2014
35	MT: ROOSVILLE	10,843	3318	2014
36	ND: SHERWOOD	10,352	3414	2014
37	VT: BEECHER FALLS	10,348	206	2014
38	ND: NECHE	9,912	3404	2014
39	ME: BRIDGEWATER	9,098	127	2014
40	ME: FORT KENT	8,933	110	2014
41	MN: ROSEAU	8,805	3426	2014
42	MN: WARROAD	8,729	3423	2014
43	ID: PORTHILL	7,464	3308	2014
44	WA: LAURIER	7,303	3016	2014
45	AK: ALCAN	6,322	3104	2014



TOP PORTS OF BORDER CROSSING/ENTRY (YEARLY) RANKED BY NUMBER OF TRUCKS				
RANK	PORT NAME	TRUCKS	PORT CODE	YEAR
46	VT: RICHFORD	6,289	203	2014
47	MN: BAUDETTE	6,268	3424	2014
48	MN: LANCASTER	5,496	3430	2014
49	ND: WESTHOPE	5,349	3419	2014
50	WA: METALINE FALLS	5,032	3025	2014
51	ND: FORTUNA	3,737	3417	2014
52	ND: NOONAN	3,594	3420	2014
53	ME: LIMESTONE	3,510	118	2014
54	AK: SKAGWAY	2,699	3103	2014
55	ND: MAIDA	2,542	3416	2014
56	ME: EASTPORT	2,268	103	2014
57	MT: PIEGAN	1,941	3316	2014
58	ND: CARBURY	1,319	3421	2014
59	MT: WILDHORSE	1,178	3323	2014
60	MT: TURNER	1,156	3306	2014
61	MT: SCOBIEY	1,141	3309	2014
62	WA: PORT ANGELES	1,121	3007	2014
63	ND: SARLES	1,105	3409	2014
64	AK: DALTON CACHE	1,096	3106	2014
65	ND: ANTLER	1,030	3413	2014
66	MT: WHITLASH	901	3321	2014
67	WA: FERRY	849	3013	2014
68	MT: MORGAN	799	3319	2014
69	ME: VANCEBORO	794	105	2014
70	MN: PINECREEK	643	3425	2014
71	ND: HANSBORO	630	3415	2014
72	MT: OPHEIM	412	3317	2014
73	ND: ST. JOHN	314	3405	2014
74	ND: HANNAH	182	3408	2014
75	MT: DEL BONITA	129	3322	2014
76	WA: DANVILLE	121	3012	2014
77	ND: AMBROSE	87	3410	2014
78	ME: PORTLAND	65	101	2014
79	WA: BOUNDARY	50	3015	2014
80	MT: WILLOW CREEK	12	3325	2014
81	WA: FRIDAY HARBOR	1	3014	2014



2.1.2.4. *Urban Areas*

The following urban areas within Michigan are the most densely populated and contain the largest number of first responders: Detroit, Flint, Ann Arbor, Midland, Lansing, Grand Rapids, Kalamazoo/Portage, Traverse City, and Pontiac. Some of these areas also contain large professional and major college athletic venues that attract large numbers of people to a small confined area. Even though these areas currently enjoy access to commercial wireless coverage, there is no priority access or dedicated bandwidth for data-intensive applications such as real-time video. These areas would greatly benefit from NPSBN coverage.

2.1.2.5. *Agency-Identified Areas*

The State solicited input from local agencies regarding areas within their jurisdiction that require coverage but were not identified on the preliminary FirstNet map. Please refer to Appendix I for images submitted by Michigan counties which identify areas where coverage is needed based upon local knowledge of special events, infrastructure, or other high risk areas for public safety.

2.1.2.6. *Deployable Assets*

FirstNet has indicated that terrestrial-based fixed RAN coverage will be augmented by the use of deployable systems on wheels (SOWs) or cells on wheels (COWs) in areas lacking adequate coverage. Michigan recognizes that these deployable assets provide solutions for adding coverage and/or capacity to an area in need of either element in order to support an incident response. However, deployable assets present problems in the form of response time to obtain, and then set-up time once onsite. Michigan stakeholders feel the use of deployable assets to provide coverage and/or capacity should be subject to the following requirements:

- (A) No more than 10 percent of the land area within Michigan shall be dependent upon deployable assets for coverage
- (B) Deployable assets shall be provided in such a quantity that they can be stored in geographically diverse locations across the state, so that no deployable asset is located more than a one-hour drive from any location within the state
- (C) Backhaul must be included on each deployable unit with auto-acquiring broadband antenna tracking technology, to enable a direct connection into the NPSBN without the burden of recurring costs for planned coverage
- (D) Satellite communications must be included to establish a connection to the NPSBN in instances where on-demand coverage is needed and no network connection is otherwise available.

Paragraphs (A) and (B) above reflect the State's concerns regarding the provisioning of NPSBN coverage via deployable assets. Most public safety incident responses are concluded within several minutes to a few hours. This is within the window of time that it would take to deploy and set up a COW or SOW. First responders need access to incident data within that timeframe, which cannot be provided by deployable assets. Deployable assets are very good at providing coverage and/or additional capacity during incidents



MICHIGAN DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET

which last for an extended timeframe, but even in those situations, the most critical time often is in the first minutes to hours of the response, during which responders would have no NPSBN coverage.

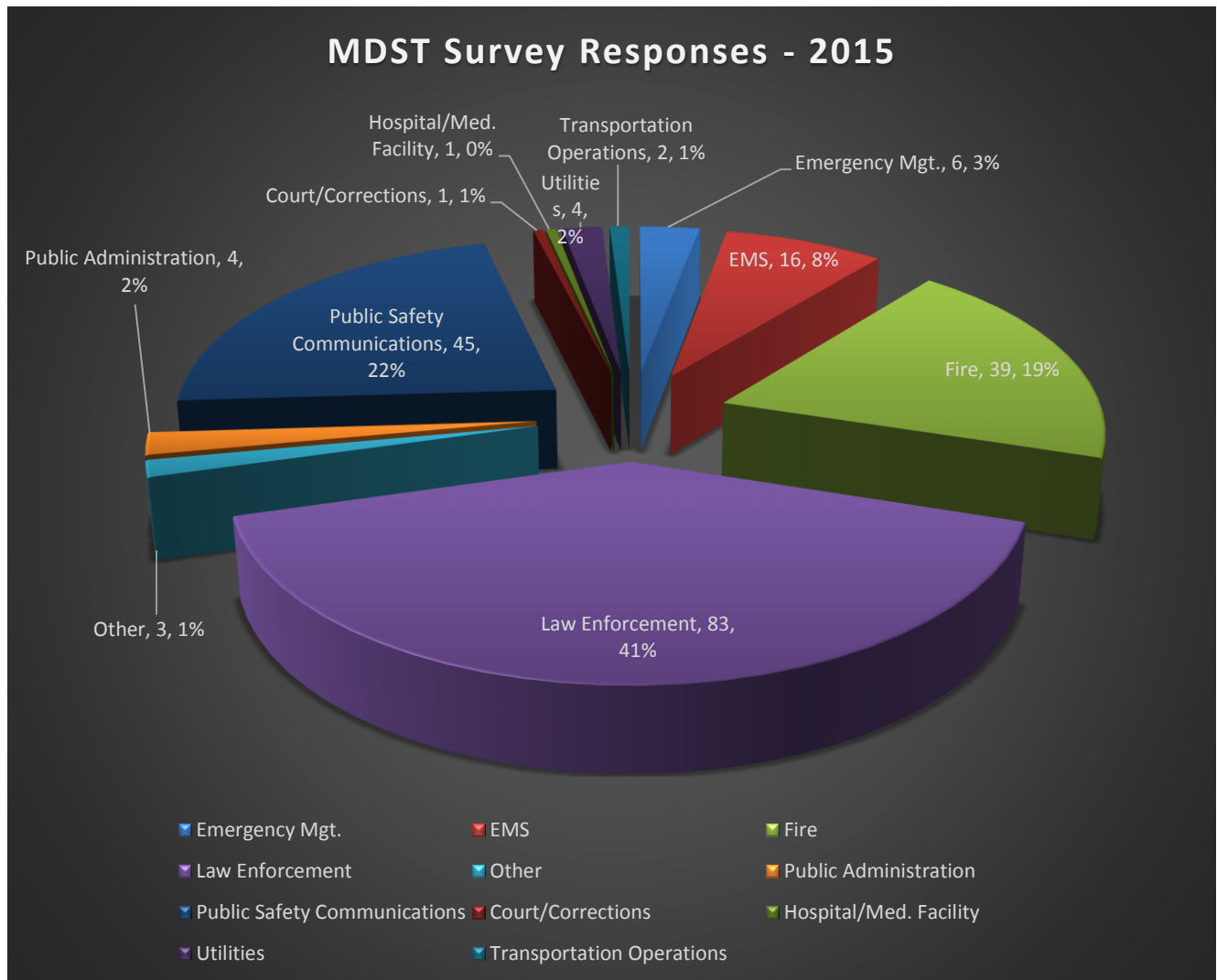
Remainder of page intentionally left blank.



2.2. USERS AND OPERATIONAL AREAS

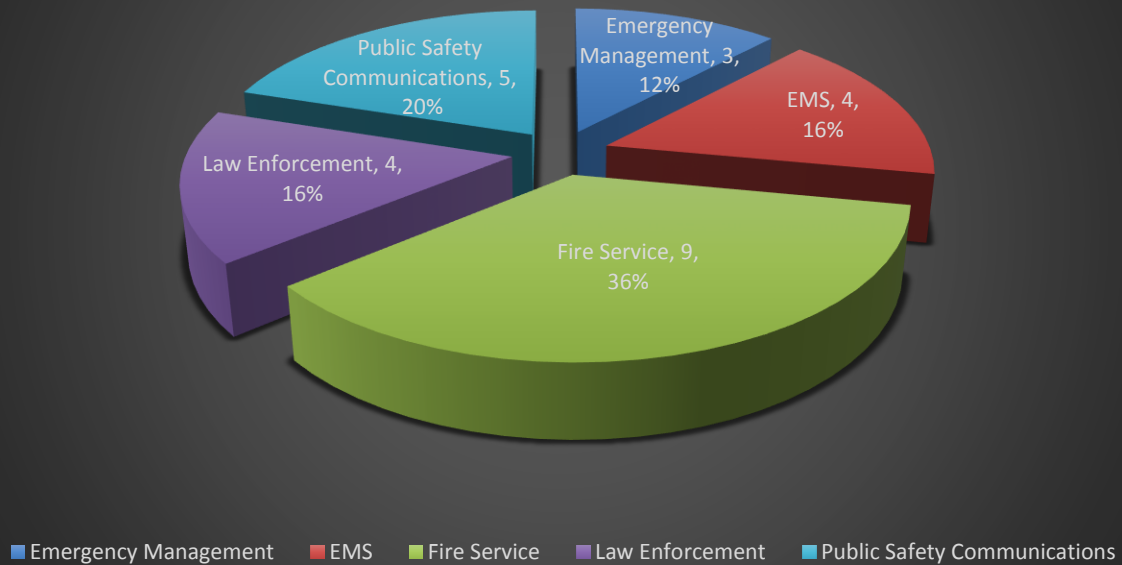
2.2.1. Agency Disciplines, Number of Employees and Devices

The following charts represent the breakdown, by discipline, of the agencies that responded to the MDST survey.:

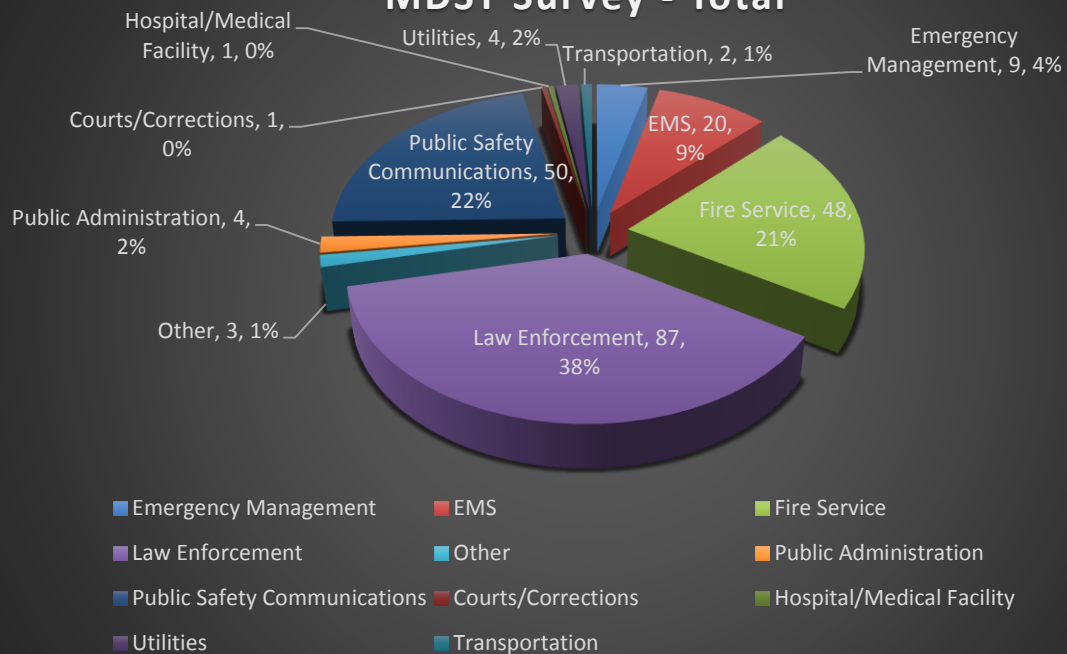




MDST Survey - 2016 New Submissions

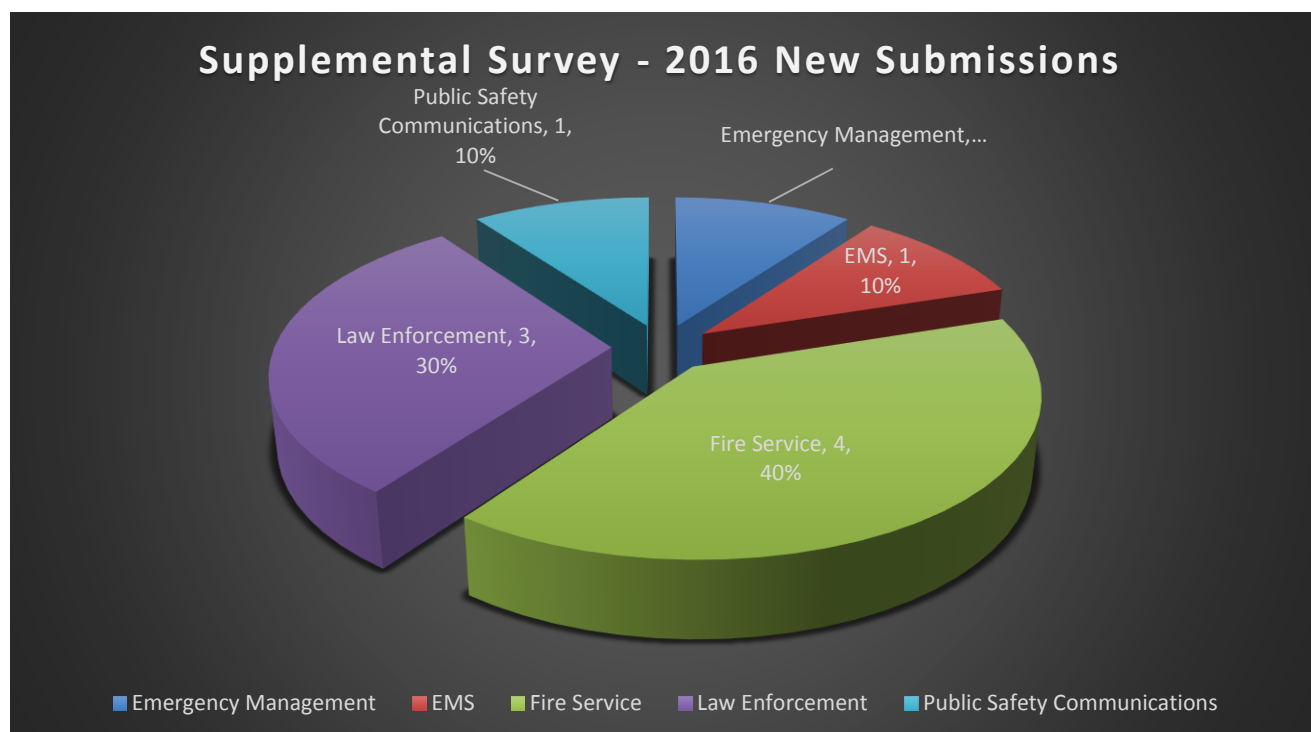
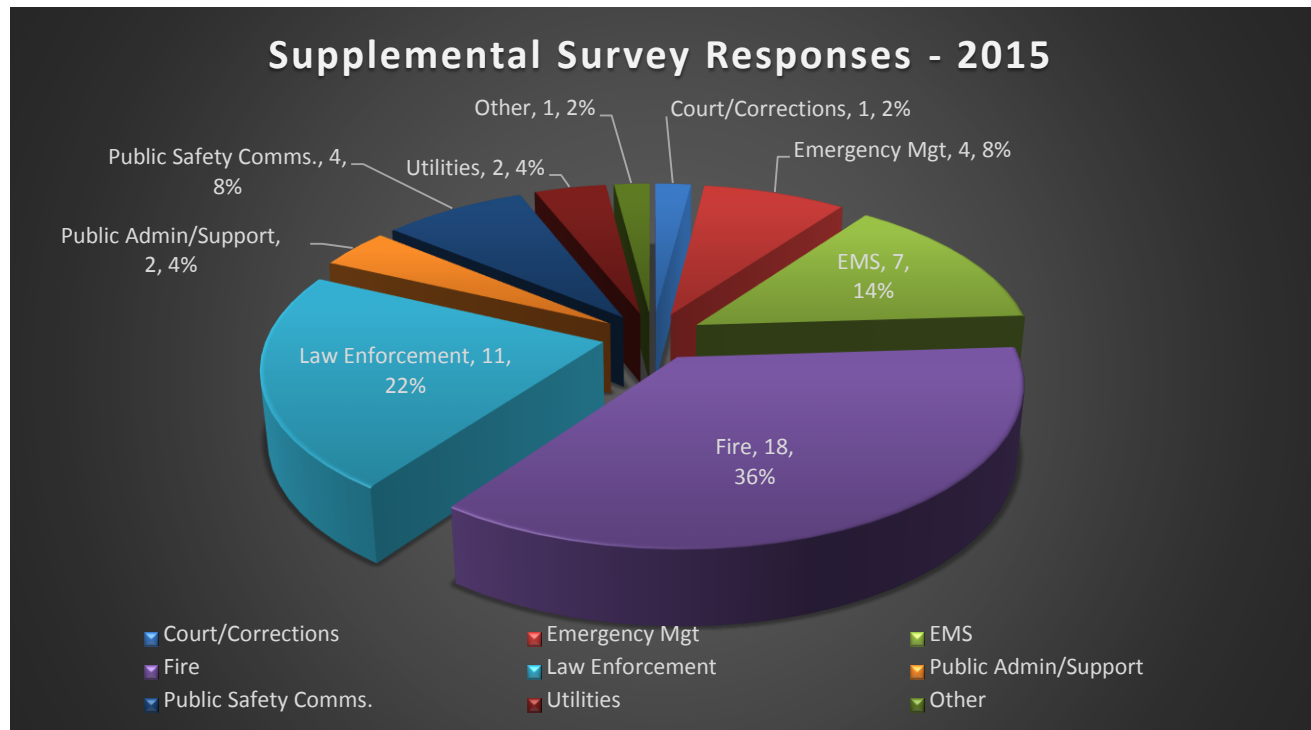


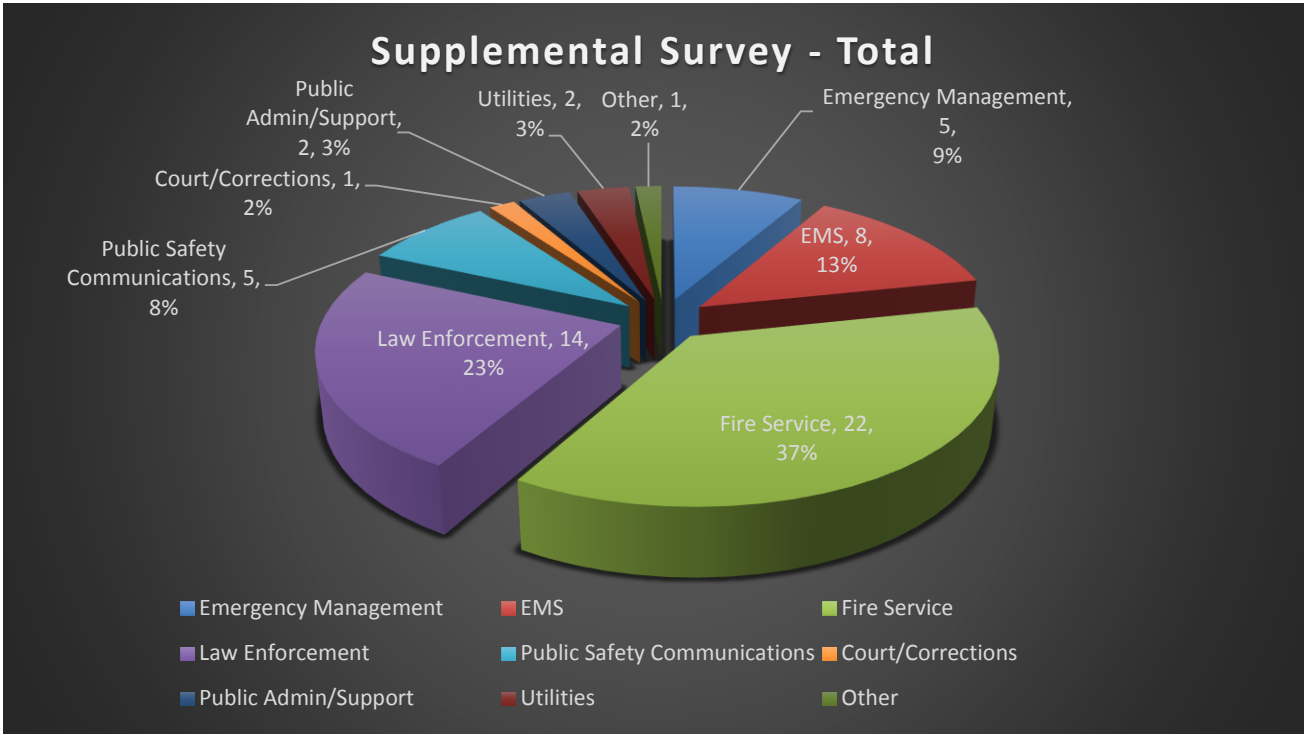
MDST Survey - Total





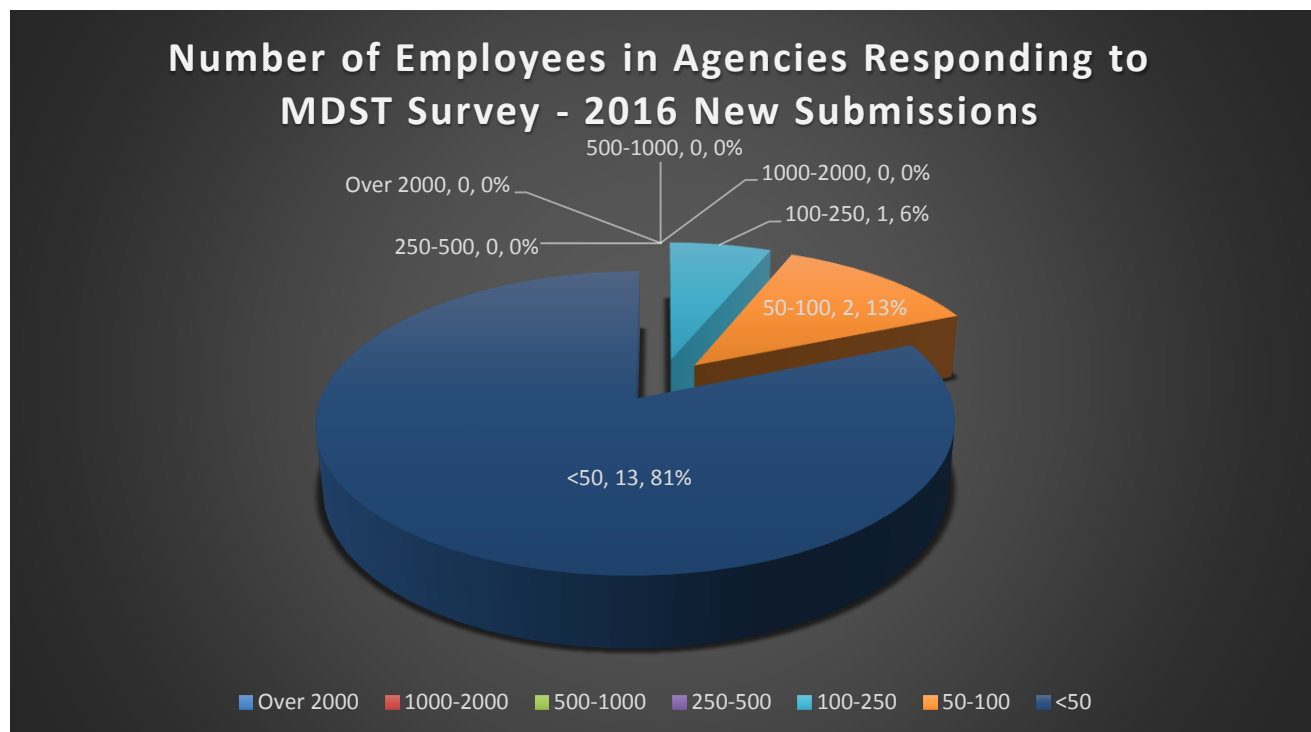
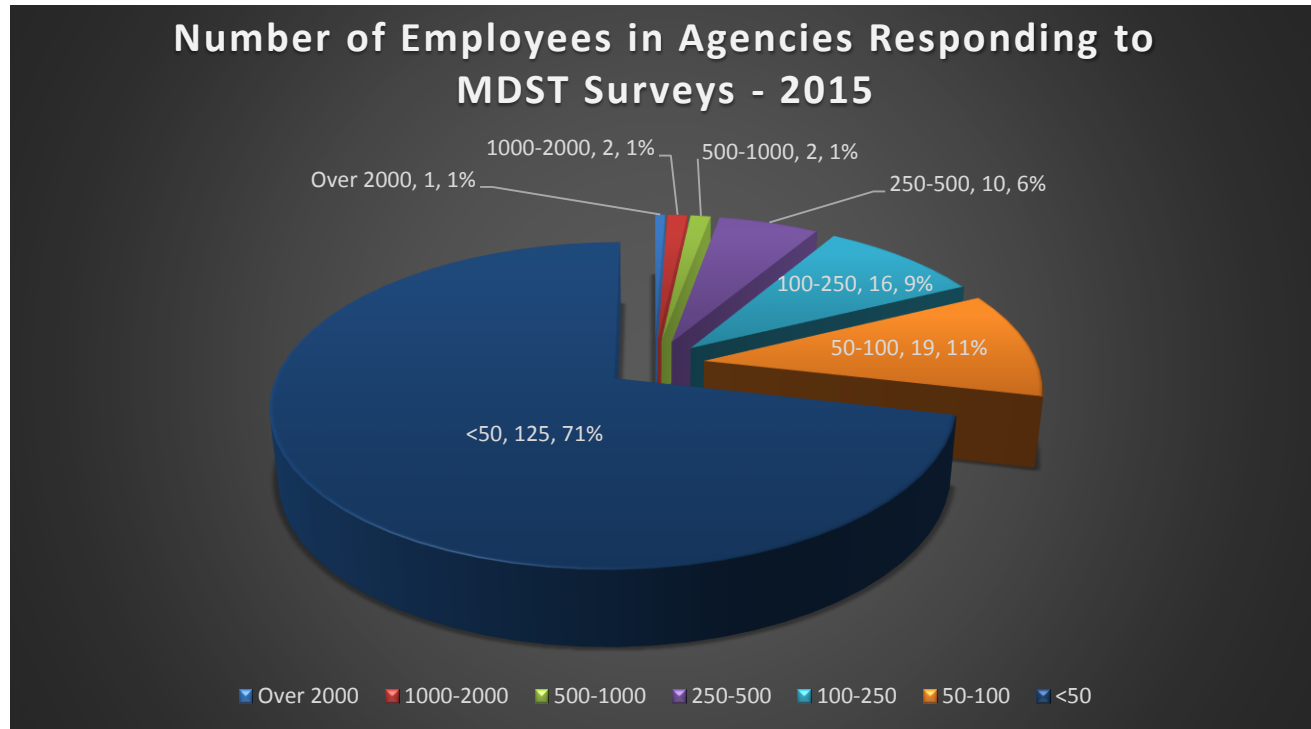
In addition to surveys containing the MDST questions, a supplemental survey was disseminated to agencies that requested additional information concerning coverage objectives, LMR coverage levels, and capacity issues. The following charts represent the responses to the supplemental survey.

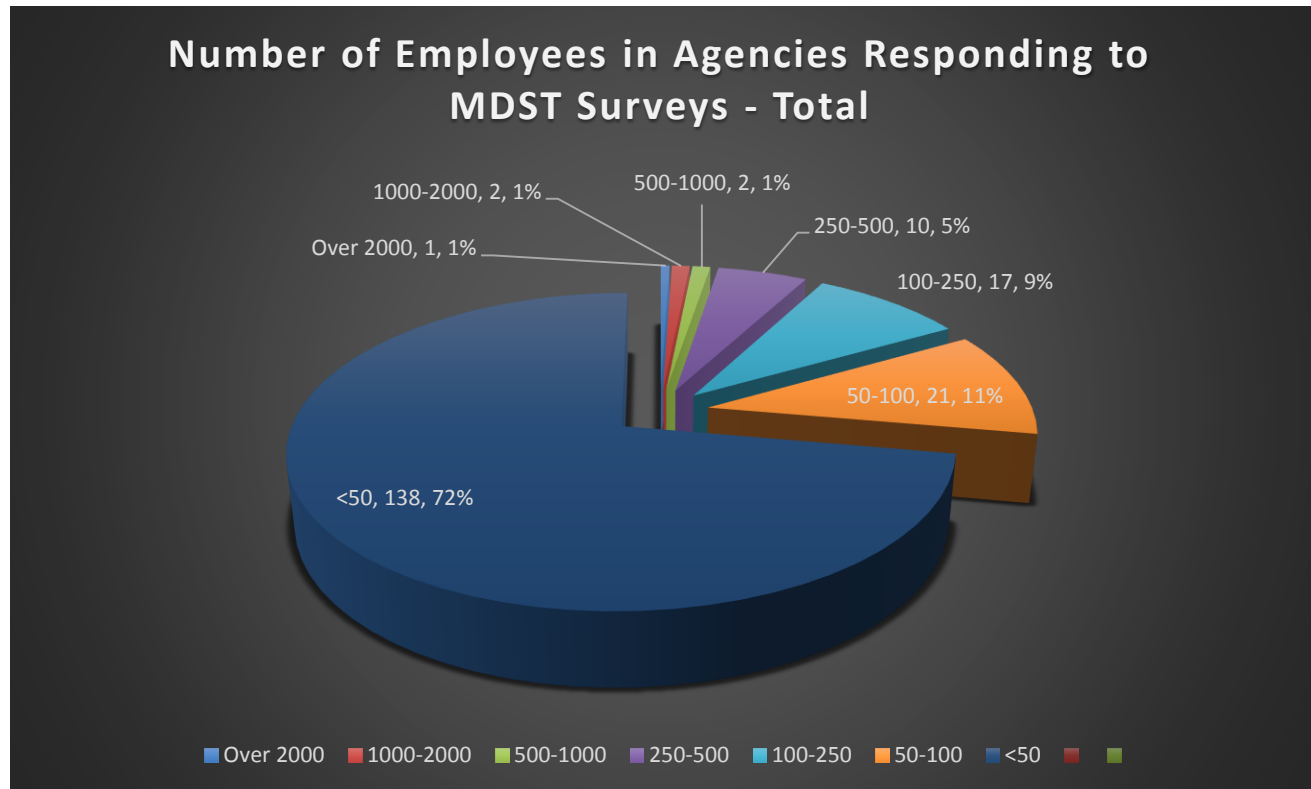






The following charts depict the number of employees within agencies that responded to the MDST survey:

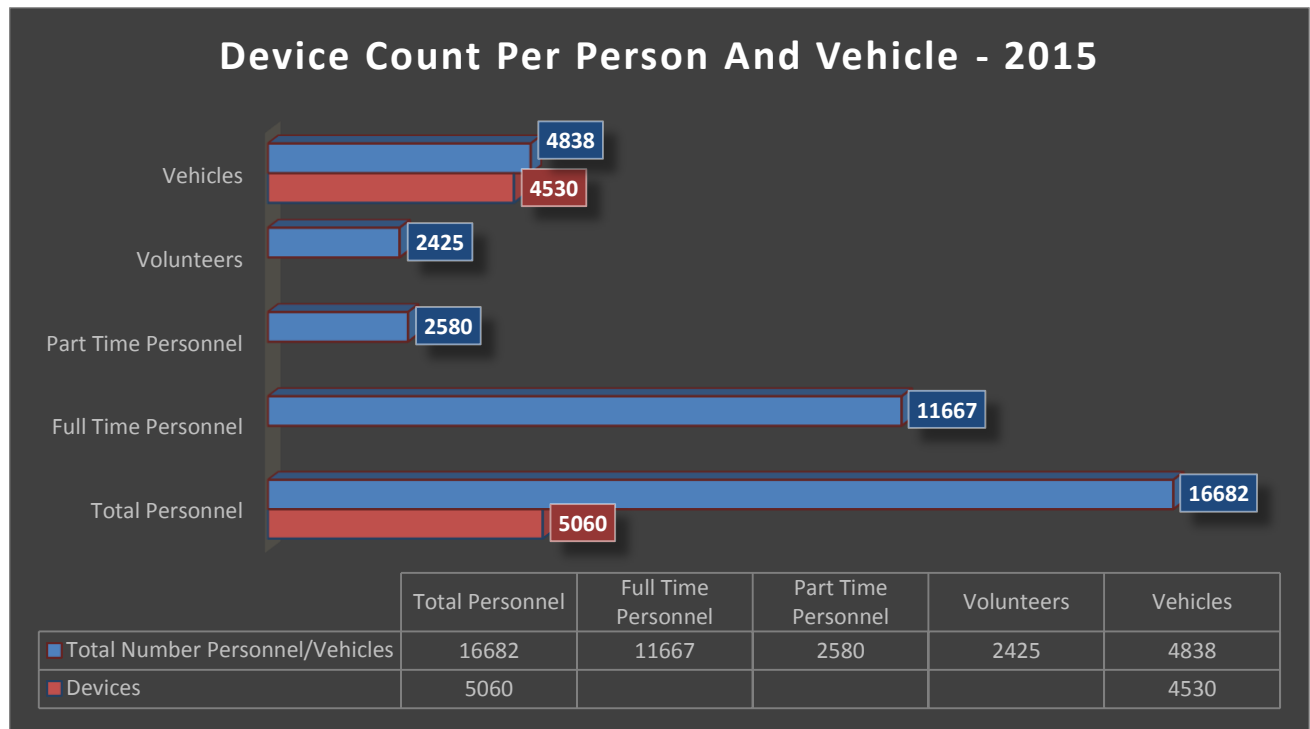






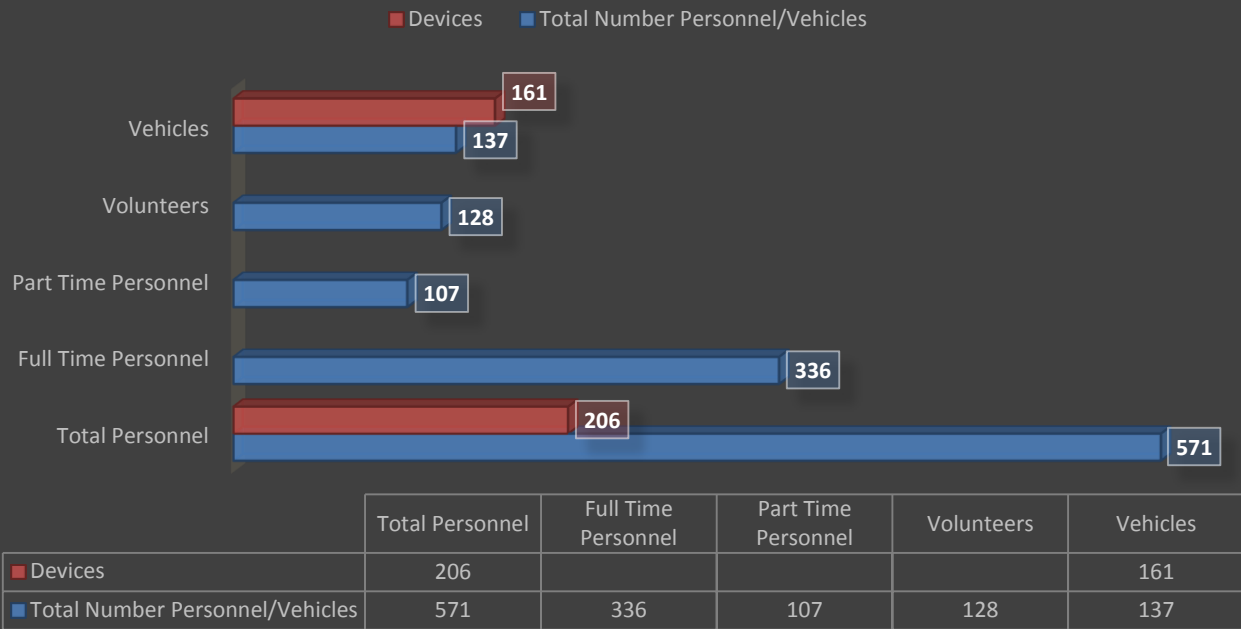
MICHIGAN DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET

According to the information provided by DHS/OEC during the Michigan coverage workshop, there are an estimated 51,023 primary first responders in Michigan. The MDST survey responses in 2016 represented a total of 571 personnel. This accounts for approximately 1.1 percent of the total within the state. Additionally, the survey responses encompassed approximately 137 total vehicles for those agencies. The results further indicated a total number of broadband devices (e.g., smartphones, in-vehicle tablets and personal computers, and mobile data terminals) issued to personnel of 206, and a total of 161 such devices issued to vehicles. The MDST survey responses for both 2015 and 2016 represented a total of 17,253 personnel. This accounts for approximately 33.8 percent of the total within the state. Additionally, the survey responses encompassed approximately 4,975 total vehicles for those agencies. The results further indicated a total number of broadband devices (e.g., smartphones, in-vehicle tablets and personal computers, and mobile data terminals) issued to personnel of 5,266, and a total of 4,691 such devices issued to vehicles. The charts below depict these results.

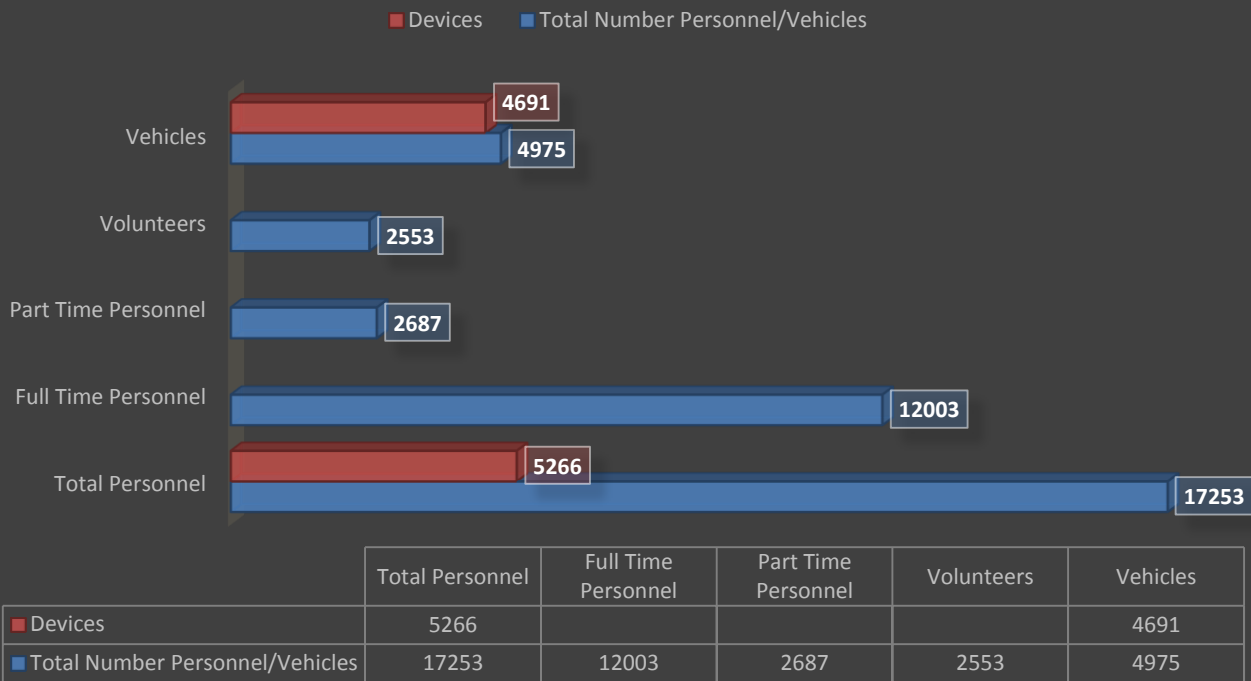




Device Count Per Person And Vehicle - 2016 New Entries



Device Count Per Person And Vehicle - Total





As indicated by the survey responses, the percentage of devices issued to personnel is approximately 30.5 percent, and the percentage of devices issued to vehicles is approximately 94.3 percent. Extrapolating those ratios across the entire first responder population results in approximately 15,562 devices for personnel, and approximately 12,846 devices for vehicles, for a grand total of 28,408 devices. (These calculations assumed the percentage of vehicles per person in the survey of approximately 26.7 percent was consistent across the state, and would reflect approximately 13,623 vehicles statewide.) However, these numbers only reflect the current reported users within the survey. Insofar as potential users are concerned, it logically can be inferred that if the network delivers what has been promised concerning bandwidth dedicated to public safety, the usefulness of the developed applications for public safety will drive increased adoption, provided the business model is in line with current commercial offerings. Additionally, if the network allows a “bring your own device” policy, the number of devices easily could increase these estimates by three or four times when taking into consideration all public safety entities that may have access to the system.



2.2.2. Eligible Users

2.2.2.1. Homeland Security Act and The Communications Act of 1934

Public safety entities generally are understood to be the protectors of life and property in the United States. This distinction is important, as it defines what entities are authorized to operate on the NPSBN. A definition of “public safety entity” is contained in the Act (Public Law 112-96) that created FirstNet; this definition references two other federal laws. According to the Act:

- The term “public safety entity” means an entity that provides public safety services
- The term “public safety services”:
 - has the meaning given the term in Section 337(f) of the Communications Act of 1934 [47 U.S.C. 337 (f)]
 - includes services provided by emergency response providers, as that term is defined in Section 2 of the Homeland Security Act of 2002 (6 U.S.C. § 101).

The Communications Act of 1934 As Amended (Title 47 of the United States Code) – 47 U.S.C

§ 337(f) defines “public safety services” as services:

- of which the sole or principal purpose is to protect the safety of life, health, or property
- that are provided (i) by state or local government entities; or (ii) by nongovernmental organizations that are authorized by a governmental entity whose primary mission is the provision of such services
- that are not made commercially available to the public by the provider.

Homeland Security Act of 2002 (6 U.S.C. § 101) states the term “emergency response providers” includes federal, state, and local governmental and nongovernmental emergency public safety, fire, law enforcement, emergency response, emergency medical entities (including hospital emergency facilities), as well as related personnel, agencies, and authorities.

The Act requires equipment used on the network to be “...(ii) capable of being used by any public safety entity and by multiple vendors across all public safety broadband networks operating in the 700 MHz band.”

2.2.2.2. Michigan Interpretation of the Act Pertaining to Public Safety Entities

Michigan has conducted a survey of the public safety entities that serve the State, including tribal nations. In interpreting the term “public safety entities,” the state has reviewed Michigan statutes and some federal agency definitions of public safety entities and public safety personnel.

Law enforcement agencies are defined by the US. Department of Justice, Bureau of Justice Statistics as follows:



MICHIGAN DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET

"The generic name for the activities of the agencies responsible for maintaining public order and enforcing the law, particularly the activities of prevention, detection, and investigation of crime and the apprehension of criminals."¹

Law enforcement agencies in Michigan employ police officers who are engaged in the enforcement of laws, ordinances and regulations.

Police officers or law enforcement officers are defined by Act 203 of 1965, Commission on Law Enforcement Officers Standards Act. 1965 PA 203 § 28.602 defines "police officer" or "law enforcement officer" as follows:

"Police officer" or "law enforcement officer" means, unless the context requires otherwise, any of the following:

(i) A regularly employed member of a law enforcement agency authorized and established by law, including common law, who is responsible for the prevention and detection of crime and the enforcement of the general criminal laws of this state. Police officer or law enforcement officer does not include a person serving solely because he or she occupies any other office or position.

(ii) A law enforcement officer of a Michigan Indian tribal police force, subject to the limitations set forth in section 9(7).

(iii) The sergeant at arms or any assistant sergeant at arms of either house of the legislature who is commissioned as a police officer by that respective house of the legislature as provided by the legislative sergeant at arms police powers act, 2001 PA 185, MCL 4.381 to 4.382.

(iv) A law enforcement officer of a multicounty metropolitan district, subject to the limitations of section 9(8).

(v) A county prosecuting attorney's investigator sworn and fully empowered by the sheriff of that county.

(vi) A fire arson investigator from a fire department within a village, city, township, or county who is sworn and fully empowered by the chief of police of that village, city, township, or county.

(m) "Rule" means a rule promulgated under the administrative procedures act of 1969, 1969 PA 306, MCL 24.201 to 24.328.²

Firefighters are defined by Act 291 of 1966, Firefighters Training Council Act. 1966 PA 291 § 29.362 defines "firefighter" as follows:

¹ <http://www.bjs.gov/index.cfm?ty=tp&tid=7>

² [http://www.legislature.mi.gov/\(S\(cukb4dllq1tb1spmpaftrtdz0\)\)/mileg.aspx?page=getObject&objectName=mcl-28-602](http://www.legislature.mi.gov/(S(cukb4dllq1tb1spmpaftrtdz0))/mileg.aspx?page=getObject&objectName=mcl-28-602)



MICHIGAN DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET

*"Firefighter" means a member, including volunteer members and members paid on call, of an organized fire department who is responsible for, or is in a capacity that includes responsibility for, the extinguishment of fires, the directing of the extinguishment of fires, the prevention and detection of fires, and the enforcement of the general fire laws of this state. Firefighter does not include a person whose job description, duties, or responsibilities do not include direct involvement in fire suppression.*³

EMS agencies and emergency medical technicians (EMTs) are defined by Act 368 of 1978, Public Health Code.⁴

"Emergency medical services" means the emergency medical services personnel, ambulances, nontransport prehospital life support vehicles, aircraft transport vehicles, medical first response vehicles, and equipment required for transport or treatment of an individual requiring medical first response life support, basic life support, limited advanced life support, or advanced life support.

"Emergency medical services personnel" means a medical first responder, emergency medical technician, emergency medical technician specialist, paramedic, or emergency medical services instructor-coordinator.

"Emergency medical services system" means a comprehensive and integrated arrangement of the personnel, facilities, equipment, services, communications, medical control, and organizations necessary to provide emergency medical services and trauma care within a particular geographic region.

"Emergency medical technician" means an individual who is licensed by the department to provide basic life support.

"Emergency medical technician specialist" means an individual who is licensed by the department to provide limited advanced life support.

Emergency management personnel/emergency management in Michigan is coordinated by the Michigan State Police under the authority of Act 390 of 1976. 1976 PA 390 § 30.402 defines "emergency management coordinator" as follows:

*"Emergency management coordinator" means a person appointed pursuant to section 9 to coordinate emergency management within the county or municipality. Emergency management coordinator includes a civil defense director, civil defense coordinator, emergency services coordinator, emergency program manager, or other person with a similar title and duties.*⁵

The following list of agencies/entities would be considered public safety entities within Michigan:

- Michigan Department of Transportation

³ [http://www.legislature.mi.gov/\(S\(nl55wo54iwgyeluxehhmtexk\)\)/mileg.aspx?page=getObject&objectName=mcl-29-362](http://www.legislature.mi.gov/(S(nl55wo54iwgyeluxehhmtexk))/mileg.aspx?page=getObject&objectName=mcl-29-362)

⁴ [http://www.legislature.mi.gov/\(S\(apyqcb13tr0pep212uzwliu\)\)/mileg.aspx?page=GetObject&objectName=mcl-368-1978-17-209](http://www.legislature.mi.gov/(S(apyqcb13tr0pep212uzwliu))/mileg.aspx?page=GetObject&objectName=mcl-368-1978-17-209)

⁵ [http://www.legislature.mi.gov/\(S\(nmdrbwtsrv3rk0o4apevg2yx\)\)/mileg.aspx?page=getObject&objectName=mcl-30-402](http://www.legislature.mi.gov/(S(nmdrbwtsrv3rk0o4apevg2yx))/mileg.aspx?page=getObject&objectName=mcl-30-402)



- Michigan Department of Health
- Not-for-profit and faith-based disaster relief agencies, e.g., American Red Cross, Salvation Army
- Transit authorities and agencies – evacuation of the public from hazards
- School transportation – coordination of evacuations
- Schools – security monitoring, emergency response, shelter operations
- Utilities – gas, water, electric for emergency response, mitigation and restoration
- Special authorities and districts – dams and flood control
- Parks – security, coordination of emergency response

The list above is not all inclusive. Indeed, public safety entities from other states and federal agencies exist that have cross-border response duties within Michigan.

The State intends to determine eligible public safety users by creating and maintaining a system that will review and approve applications for access to the NPSBN. Generally, the State will encourage participation on the NPSBN by bona fide public safety entities in order to increase interoperability and to provide access to public safety information sources and applications.

2.2.3. *Quality of Service/Priority and Preemption (QPP)*

FirstNet recently revealed information concerning its vision of how QoS and priority and preemption will work on the network. Devices on the network will be provisioned and assigned static priority levels, as will network applications. Static device-priority levels will be assigned based upon the roles that the persons issued the devices play on a day-to-day basis. During an incident response, priority levels of responders can be elevated as necessary as their role in the incident changes. As an example, a patrol officer would have the same static priority level as other patrol officers within the department. However, whenever the officer is assigned to respond to an incident, his priority level would be elevated during the response to ensure he has access to the bandwidth he needs to receive and transmit the data necessary to his/her response. FirstNet anticipates the ability to change priority levels will be accomplished through an interface between the NPSBN and the computer-aided dispatch (CAD) system at the dispatch center. When a first responder's status changes from routine to now being involved in an incident response, this information will be transmitted from the CAD system to the network to elevate his/her priority. What has not been determined at this point is what the technical aspects of the network-to-CAD interface will involve. The State will require this information as soon as it is determined, so that it can be disseminated to the PSAPs to be addressed at their level.

The network itself is envisioned as having a dynamic controller for priority and preemption, so that it can recognize whenever a sector of a cellular node is becoming overloaded with users. In this case, the network automatically would divert non-priority users, namely commercial users, off the network to provide public safety responders with access to the resources they need.

Human intervention to adjust priorities only would be necessary during an incident in which public safety overloads a cellular sector, requiring priority levels to be adjusted to ensure that the responders who are vital to the response have access to the network. FirstNet envisions that a few people within each state would be



trained to recognize this situation, and they then would interface with FirstNet personnel in order to manually adjust priorities. Michigan prefers a single state point of contact utilizing the MPSCS Network Control Center, following existing LMR procedures. This aspect of local control could be critical in a major incident, especially one which would take place in a rural area where there are much fewer overlapping cellular sites to share the network loading.

2.2.4. Site Hardening

The Michigan Public Safety Communications System (MPSCS) is the largest public safety trunked radio system in North America. It is a hardened, public safety-grade system that incorporates redundancy and resiliency features to ensure that the network is available when public safety needs it. Michigan expects the NPSBN to be hardened to at least the same level as the MPSCS.

FirstNet should ensure that the following redundancy features are included in the NPSBN:

- Each site should have battery backup capable of operating the site for a minimum of 12 hours in the event of a power failure and subsequent generator failure
- Each site should have a backup generator capable of operating the site for a minimum of 72 hours without refueling
- FirstNet should develop a written plan that will be furnished to the State describing the procedure for maintaining site operation in the event of an extended power outage
- FirstNet should maintain an adequate quantity of spare parts for each site in geographically diverse locations across Michigan, to ensure that site failures can be resolved as expeditiously as possible

FirstNet should ensure availability of properly trained technicians across the state who can respond to a critical site outage within two hours.

RAN backhaul components should consist of either microwave radio or fiber-optic cables. Leased telephone lines should be avoided for primary backhaul purposes. Redundant backhaul paths for critical sites is highly recommended.

Each site should be physically secured by locked compound fencing and locked shelter(s), providing access only to authorized personnel.

The MPSCS already has a significant amount of public safety-grade infrastructure in place across the entire state. Much of this infrastructure could be leveraged in the construction of the NPSBN. The State would be very interested in discussions with FirstNet and their partner regarding how this infrastructure could be utilized to the mutual benefit of the State and FirstNet.

2.2.5. Customer Care

Agencies within Michigan adopting the NPSBN will expect the highest level of service and care to be provided by the network operator. The State acknowledges that the network and all of the interacting components will be a highly complex environment that will be subject to a normal amount of problems/issues



that will impact operations periodically. The NPSBN is being deployed as a “public safety-grade” network, and therefore policies and procedures must be in place to adequately address these situations as they arise. Service restoration time for critical network outages that result in a reduction or loss of connectivity should be within two hours.

In addition to network issues, there must be a responsive process in place to deal with device issues such as registration, connectivity, and applications. FirstNet should provide a customer service component that is available 24 x 7 x 365 for the State to report network problems and device issues. Additionally, Michigan requires that FirstNet maintain a local presence, preferably within the MPSCS Network Control Center, to support network users. The State also requires input into the number of personnel assigned to the State by FirstNet.

2.2.6. Device Ecosystem

Michigan expects FirstNet to maintain an appropriate portfolio of devices capable of operating on the network that are ruggedized and capable of use by public safety responders. From a form factor perspective, it is anticipated that devices will evolve from their current commercial form factor into devices more suitable for public safety. First responders have been using LMR as their primary communications systems for the past 50-plus years. LMR devices have evolved dramatically over this time period, with typical current devices reflected in Figure 8 below.



Figure 8: LMR Handheld Radios

When contrasting the devices above with the currently available commercial LTE devices as depicted in Figure 9 below, stark differences in form factors easily are seen. Public safety requires devices that are easily used and manipulated in the most extreme and challenging conditions. Ease of use with a gloved hand is also essential in a public safety communications device. Yet, LMR device design in many cases still has not evolved to the point where they can be easily used in all situations, especially with gloved hands.



Consequently, this will be a major design challenge for manufacturers of LTE devices that might operate on the NPSBN. While not an absolute requirement, Michigan would very much like to see LTE device vendors moving in a direction of developing devices specifically suited to the needs and requirements of public safety operations.



Figure 9: LTE Devices

2.3. CAPACITY PLANNING

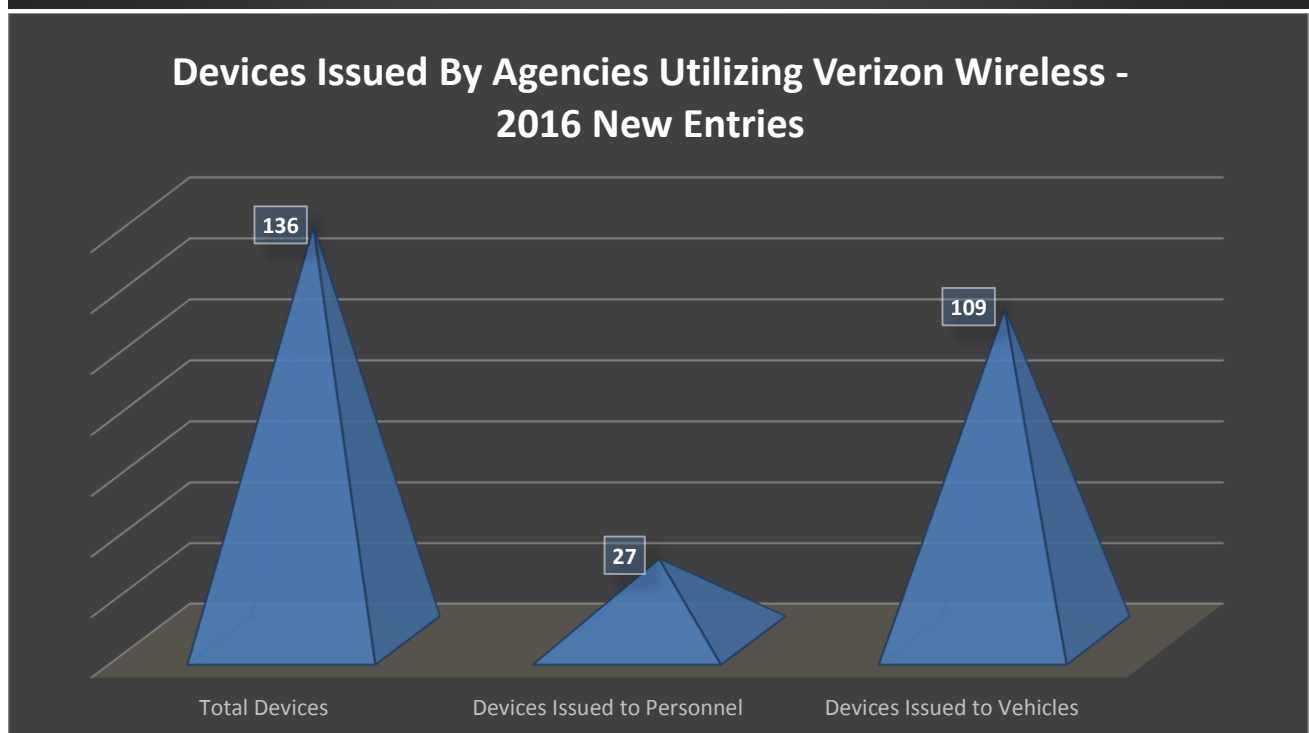
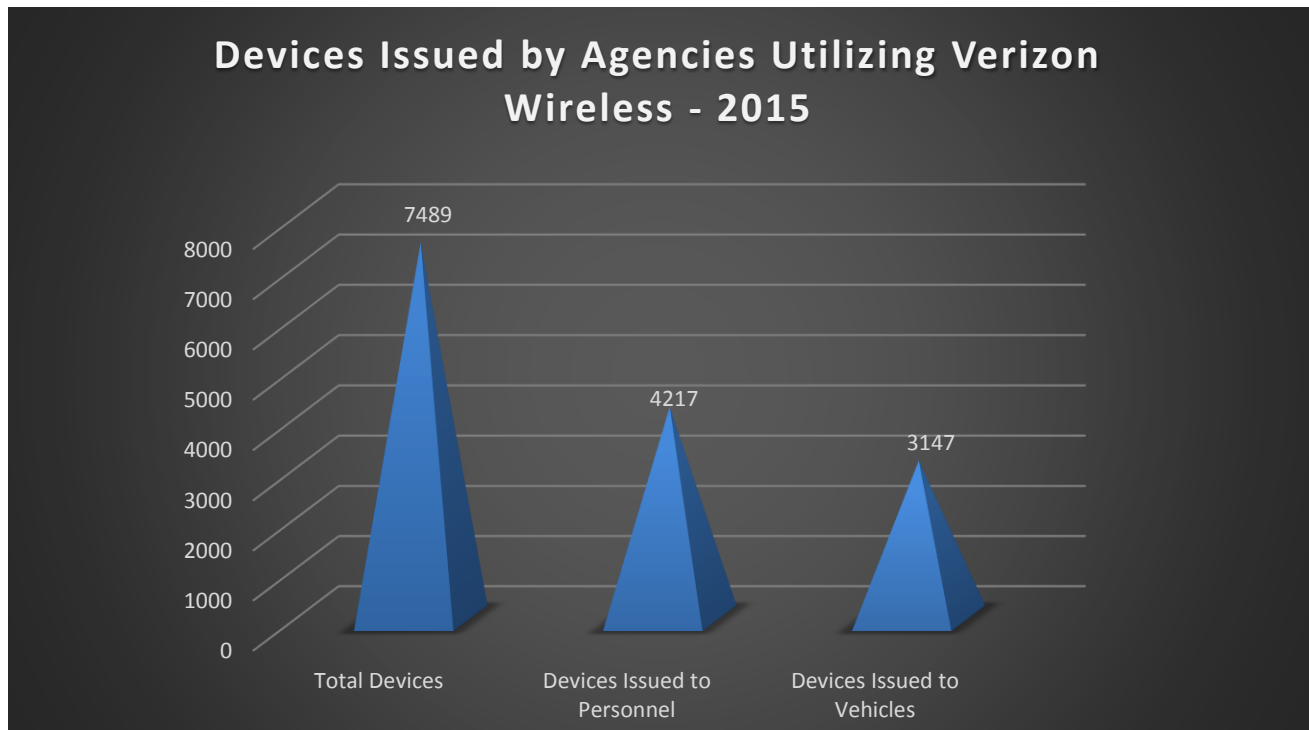
Capacity planning is especially significant in the urban/suburban areas where Michigan wants to insure the network provides adequate capacity for the number of users. The primary areas within the State where the network must insure adequate capacity are Detroit, Flint, Ann Arbor, Midland, Lansing, Grand Rapids, Kalamazoo/Portage, Traverse City, and Pontiac. Capacity planning not only needs to ensure adequate capacity on a normal day-to-day basis, but also must account for the possibility of a large number of devices operating in a small area due to a multijurisdictional response to a significant emergency incident(s). Surveys were utilized to collect capacity planning data, including current data usage (although no agencies provided current data usage), the number of devices currently in use, and the current and desired data application usage. Following are the results of those data-collection efforts.

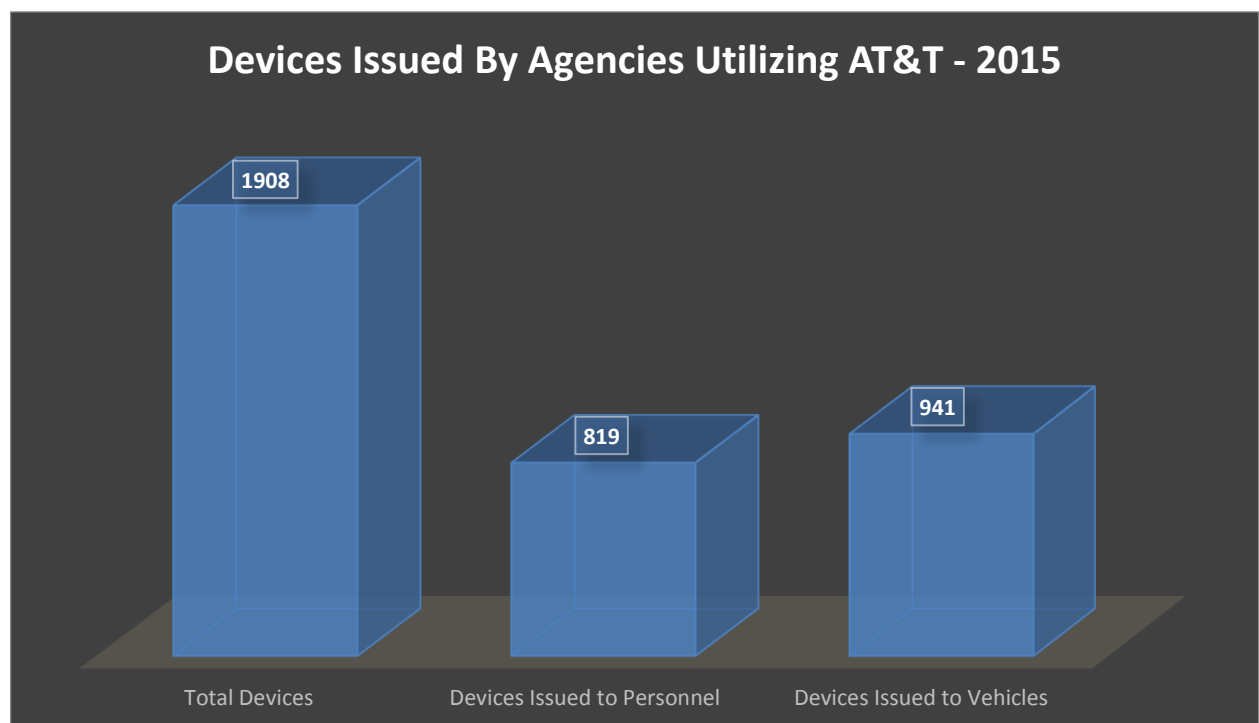
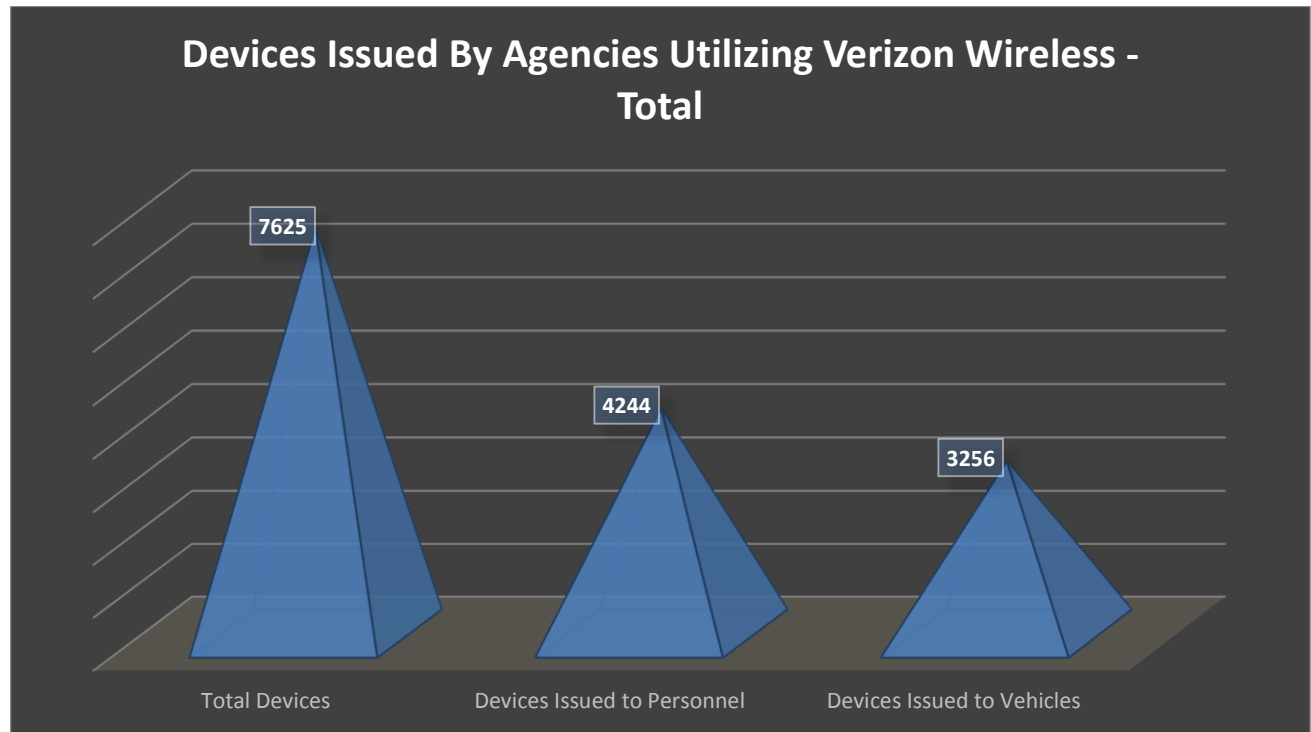
2.3.1. *Number of Devices*

Agencies were asked to indicate the number of devices currently issued to personnel and vehicles. Furthermore, the data was broken down by commercial provider. The following charts reflect the number of devices issued by agencies to personnel and vehicles with the indicated provider, with the last chart indicating the total number of devices issued by each provider. It should be noted that the numbers expressed for total devices in each chart also include other devices not issued to personnel or vehicles. It



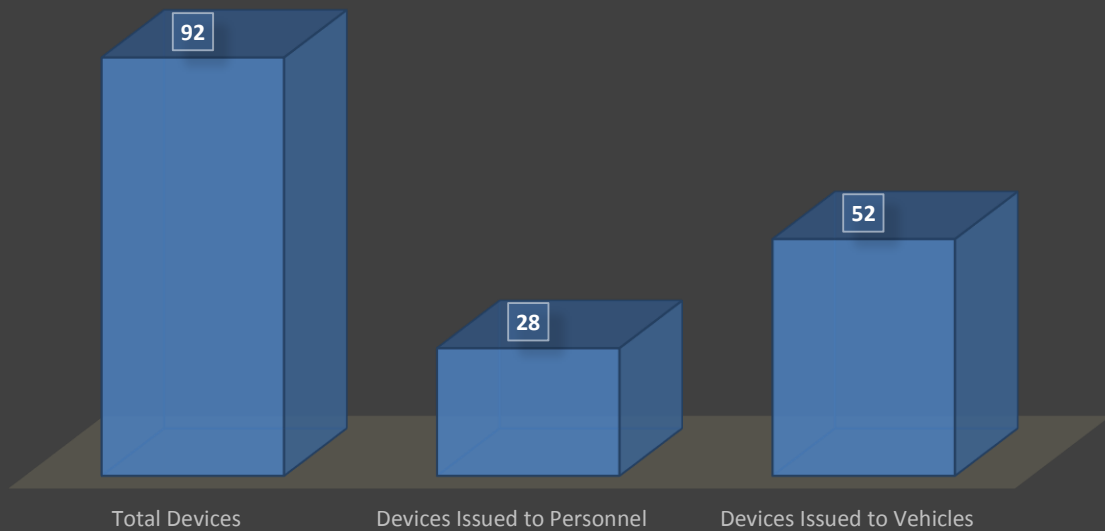
also should be noted that the only data that changed from 2015 to 2016 concerns devices issued by Verizon Wireless and AT&T, as those were the only service providers utilized by agencies responding to the data-collection effort in 2016.



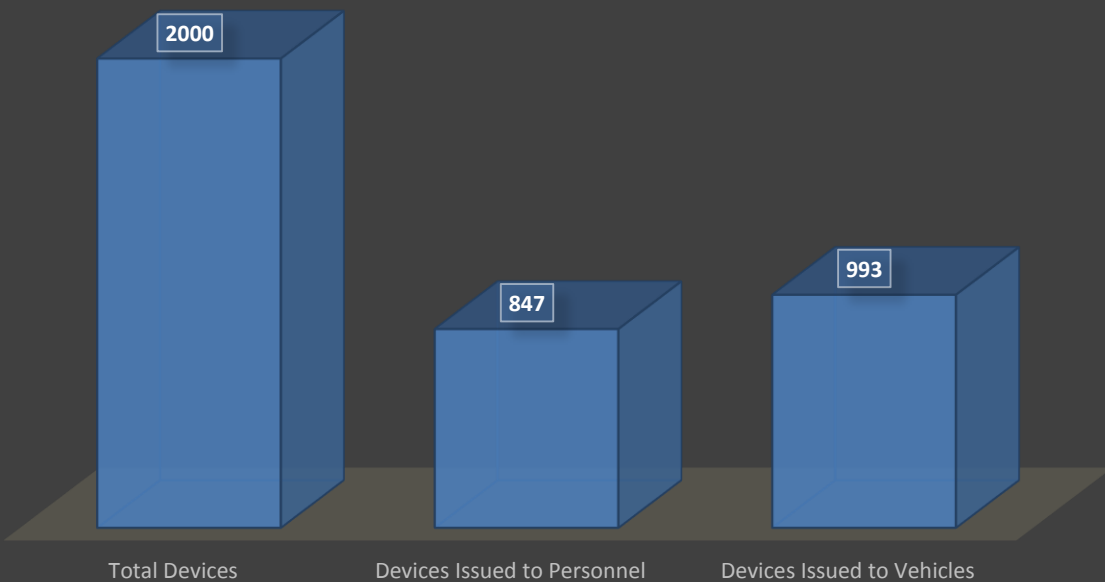


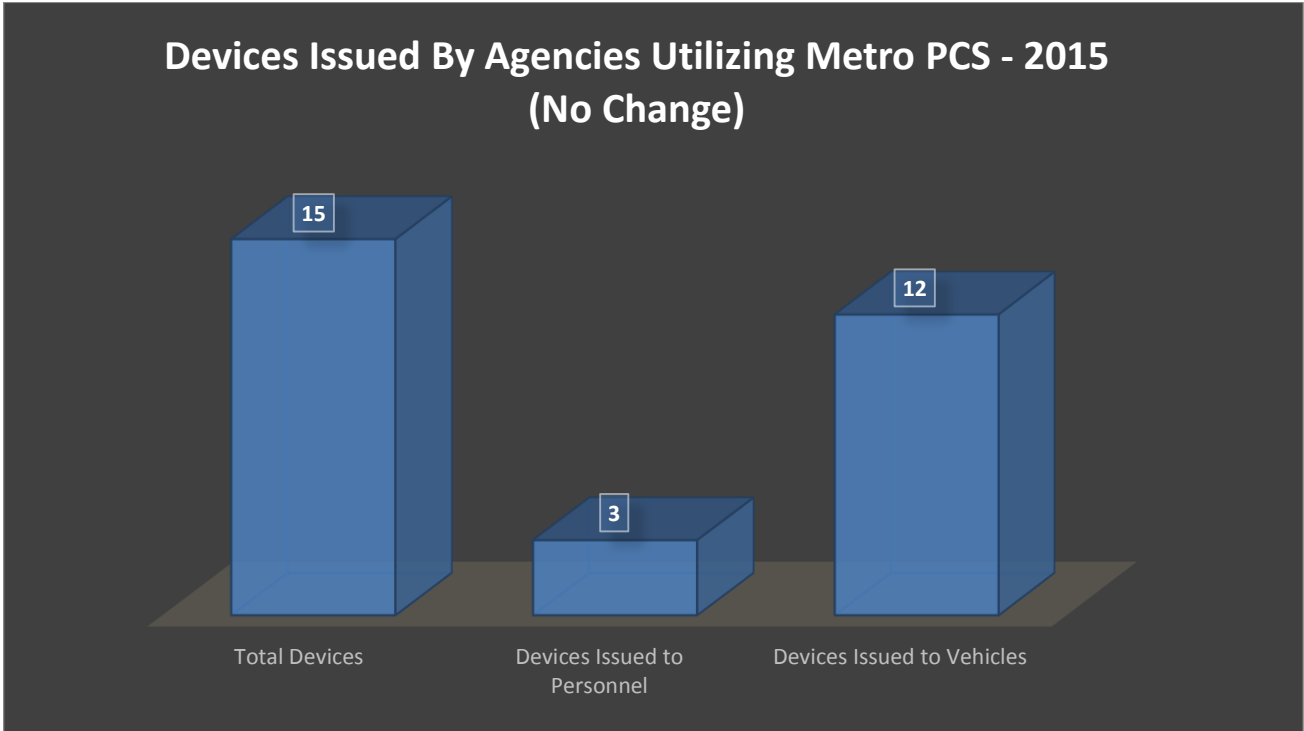
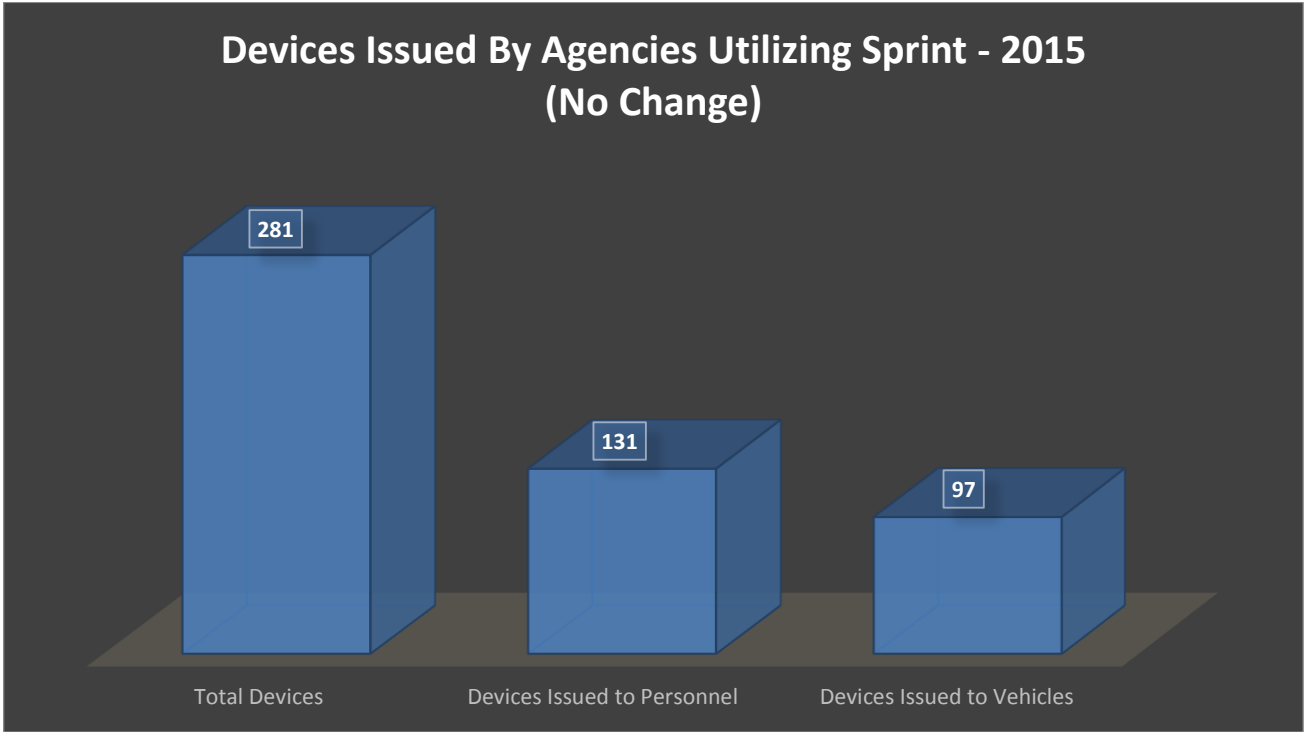


Devices Issued By Agencies Utilizing AT&T - 2016 New Entries



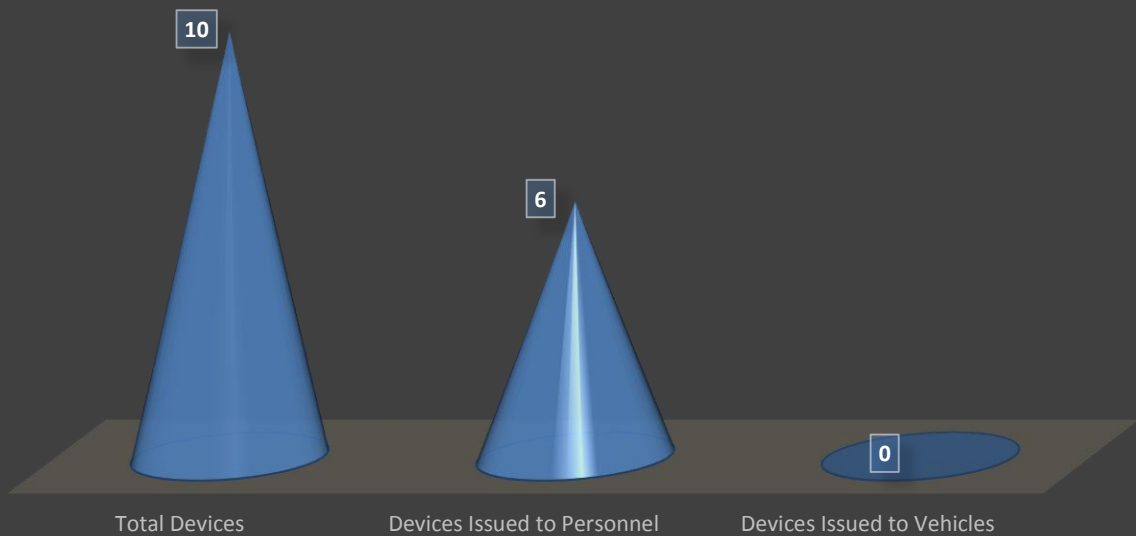
Devices Issued By Agencies Utilizing AT&T - Total



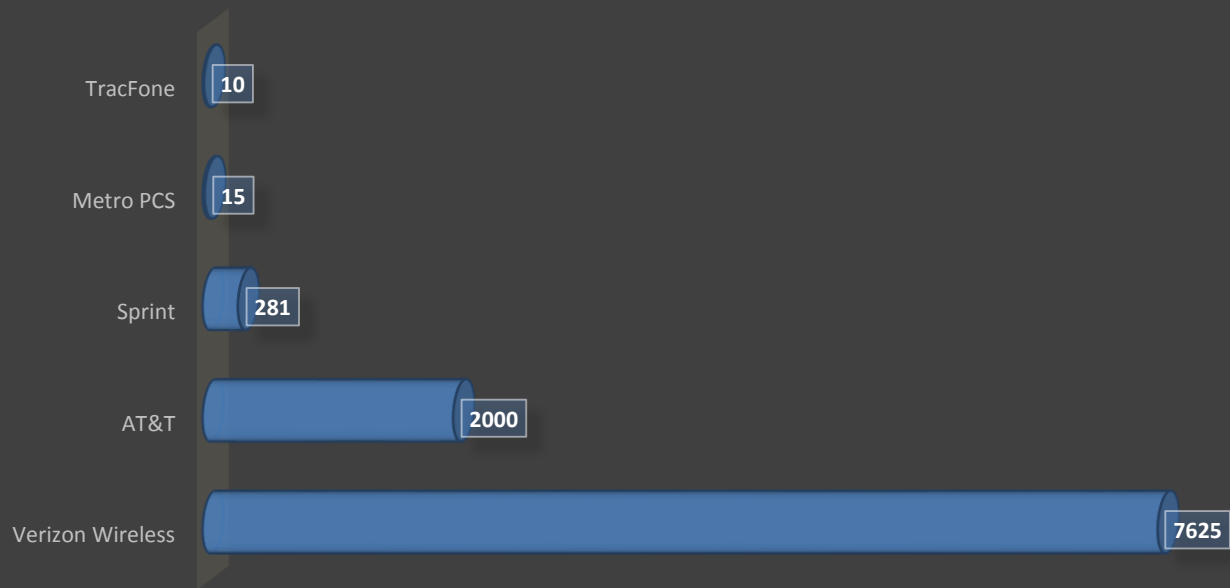




Devices Issued By Agencies Utilizing Tracfone - 2015 (No Change)

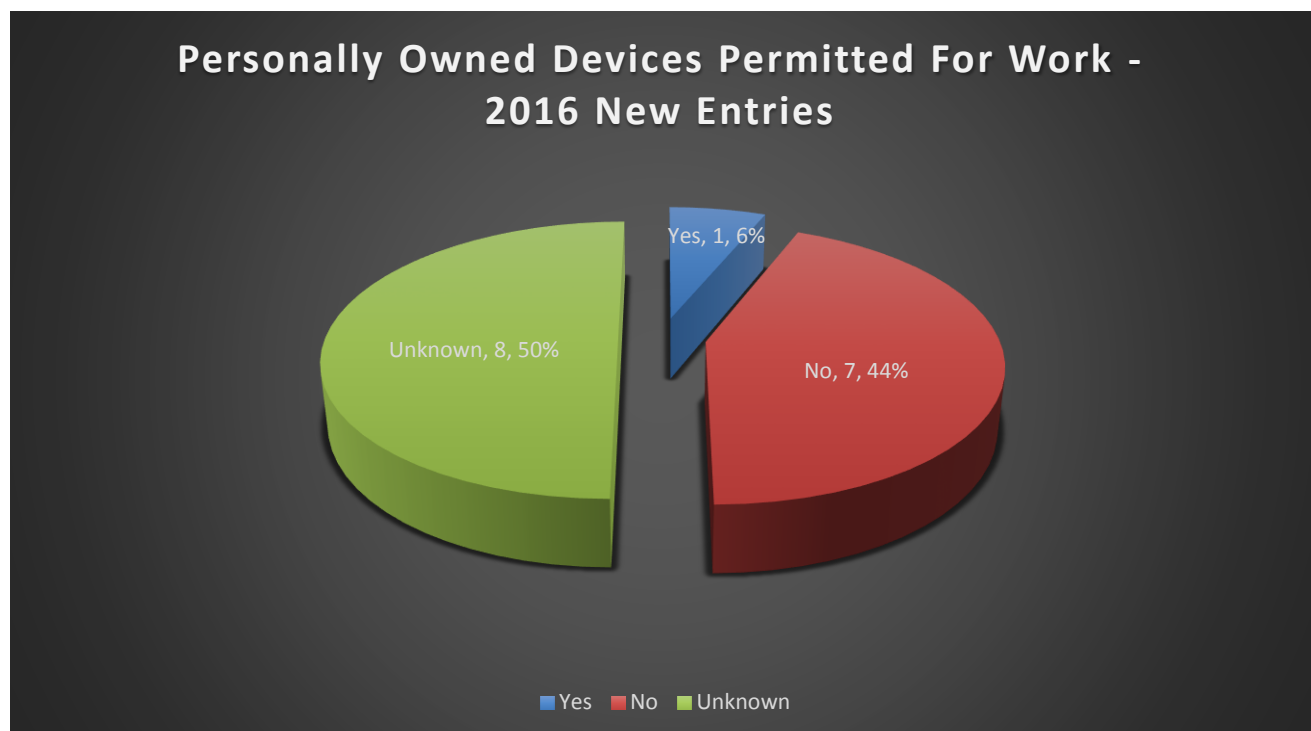
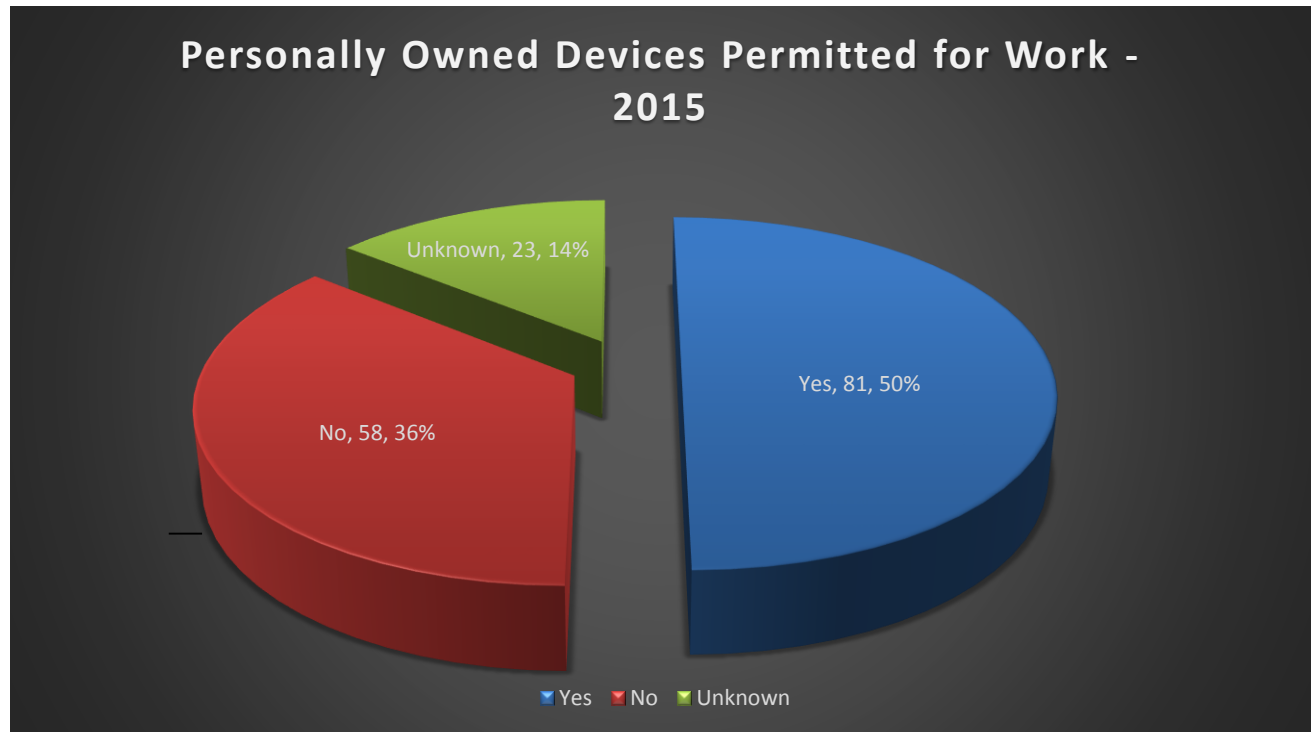


Total Devices Issued



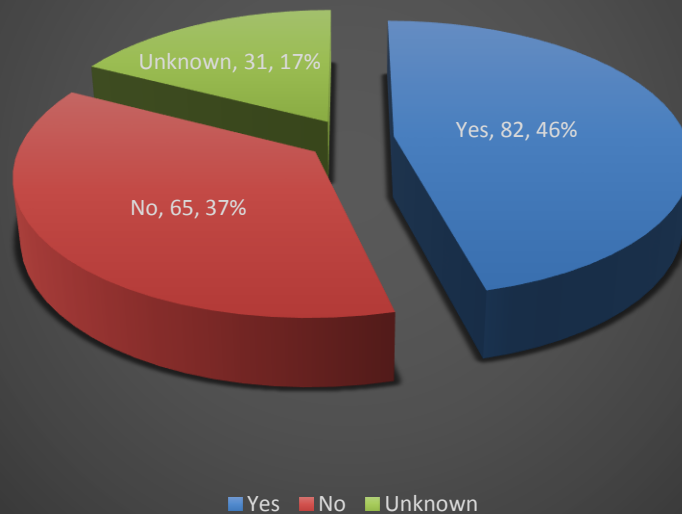


It should be noted that a significant number of agencies indicated that they permit personal devices to be utilized for work purposes.

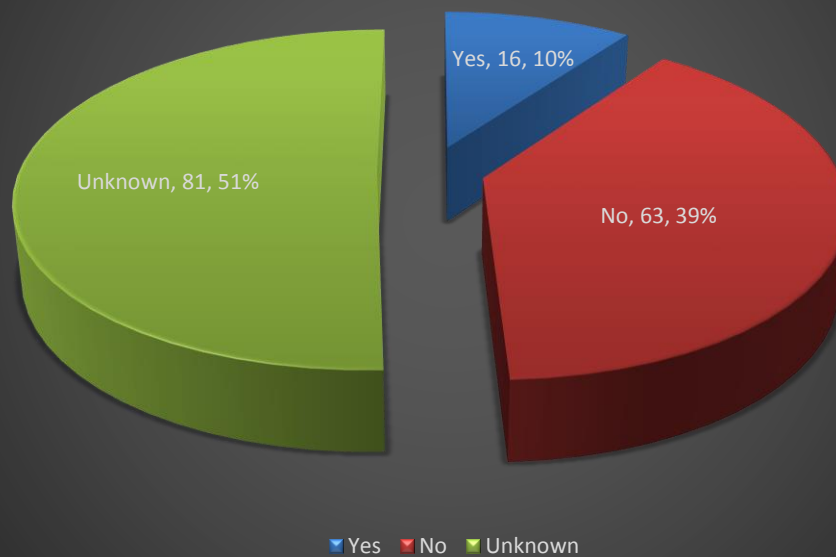




Personally Owned Devices Permitted for Work - Total

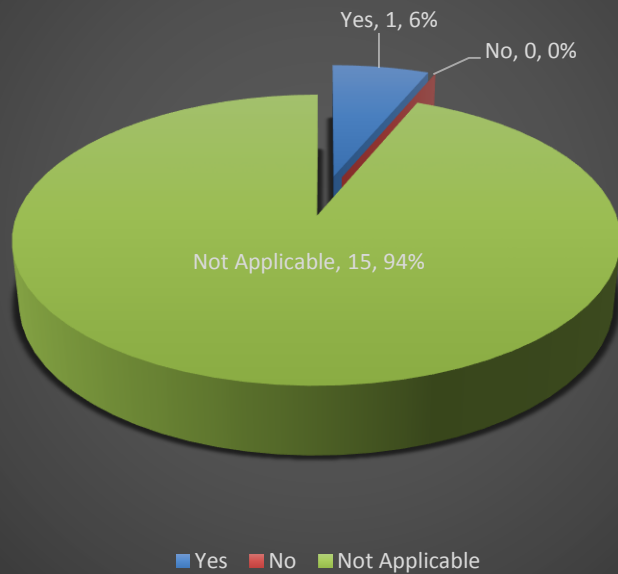


Stipend for Personally Owned Devices - 2015

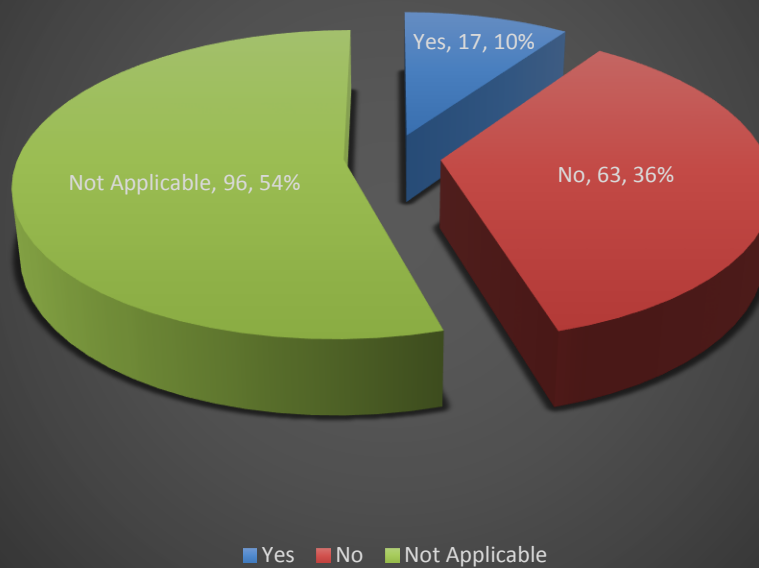




Stipend for Personally Owned Devices - 2016 New Entries



Stipend for Personally Owned Devices - Total

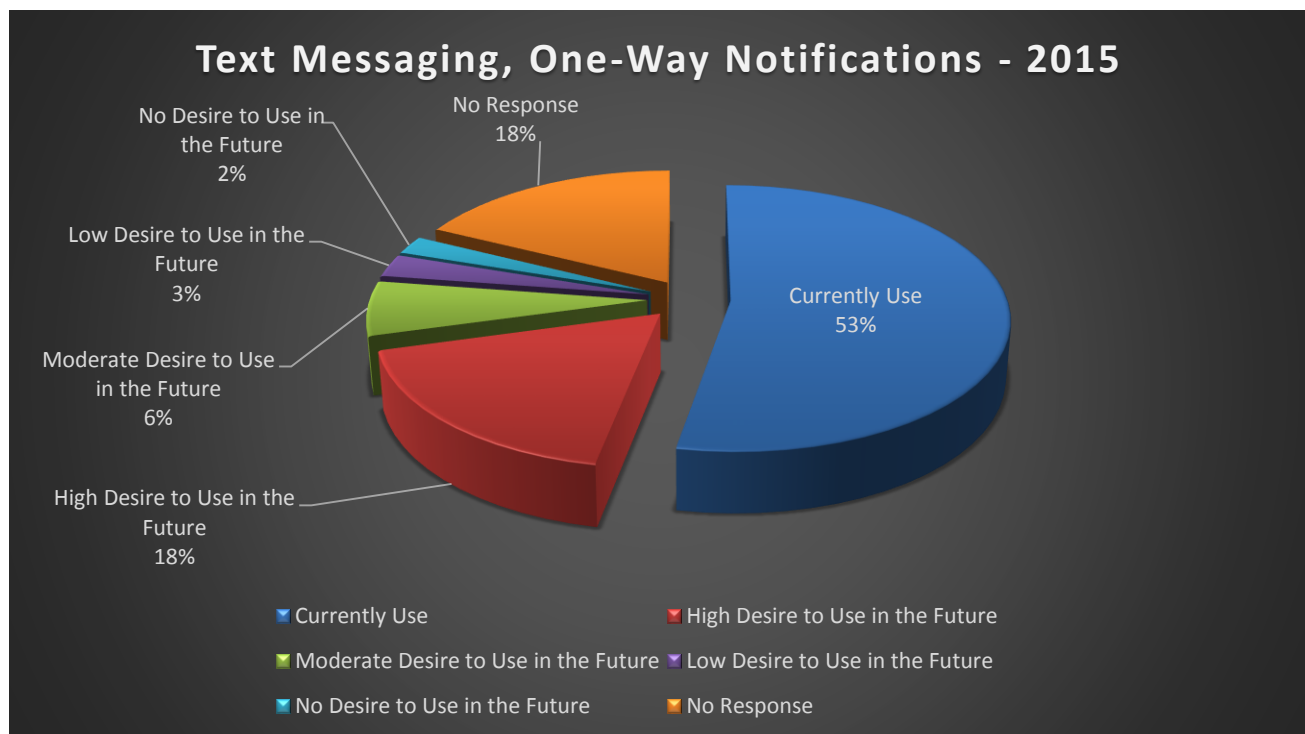




The device data received indicates that many of the agencies surveyed do not provide agency-issued devices; however, a significant number of agencies indicated that personnel are allowed to use their own devices for work purposes. Given that the majority of agencies do not currently provide broadband devices for their users, solutions must be developed to allow personal devices to access applications on the FirstNet network. Further, regardless of the capabilities provided by FirstNet, there are underlying funding limitations for most agencies that prohibit them from issuing broadband devices.

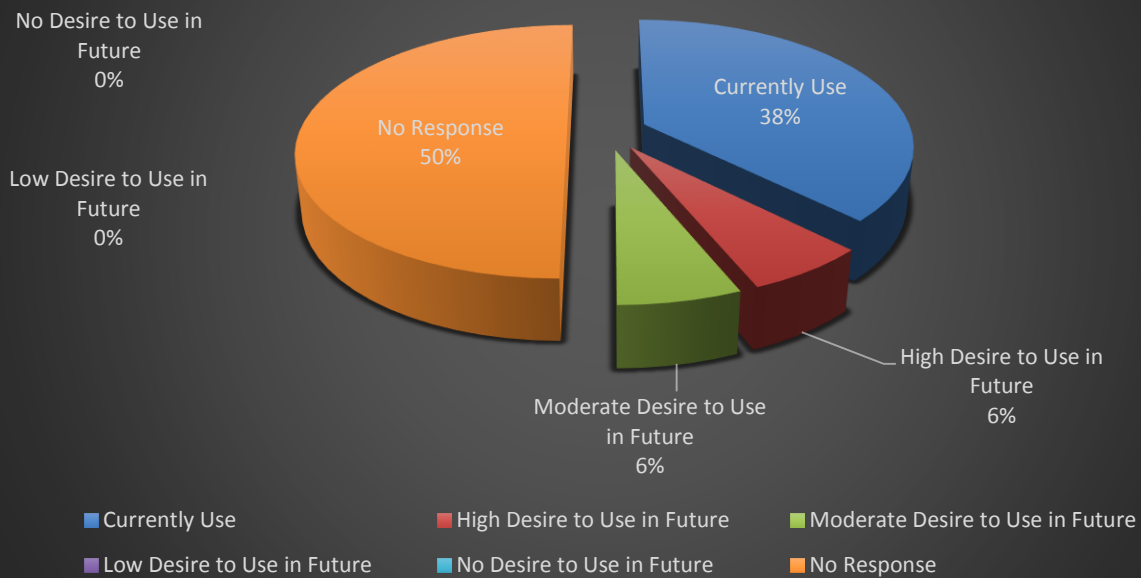
2.3.2. Data Applications

Agencies were asked to provide information concerning their current application usage as it relates to text messaging, paging, one-way communications, AVL, database inquiries, records management, computer-aided dispatch (CAD), field-based reporting, small file transfers, large file transfers, GIS applications, internet browser access, intranet /virtual private network (VPN) access to their home network, tactical “chat” rooms, transmitting low-quality video, transmitting high-quality video, and telemetry. The graphs below depict the results of the responses as to the current frequency of use of each application, as well as whether agencies would desire to use the application in the future.

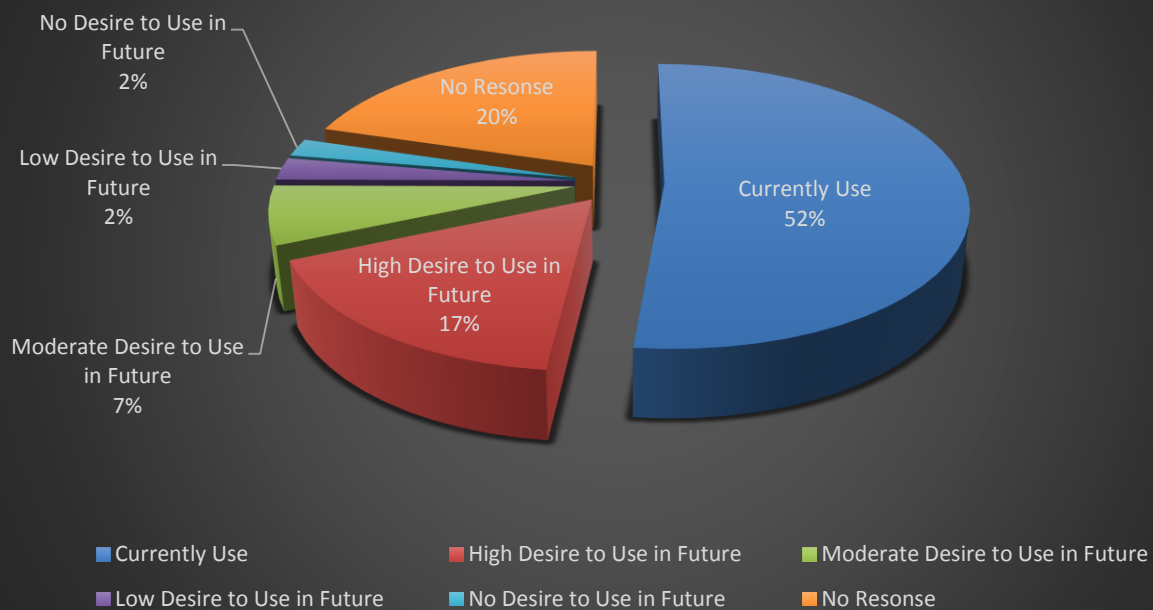


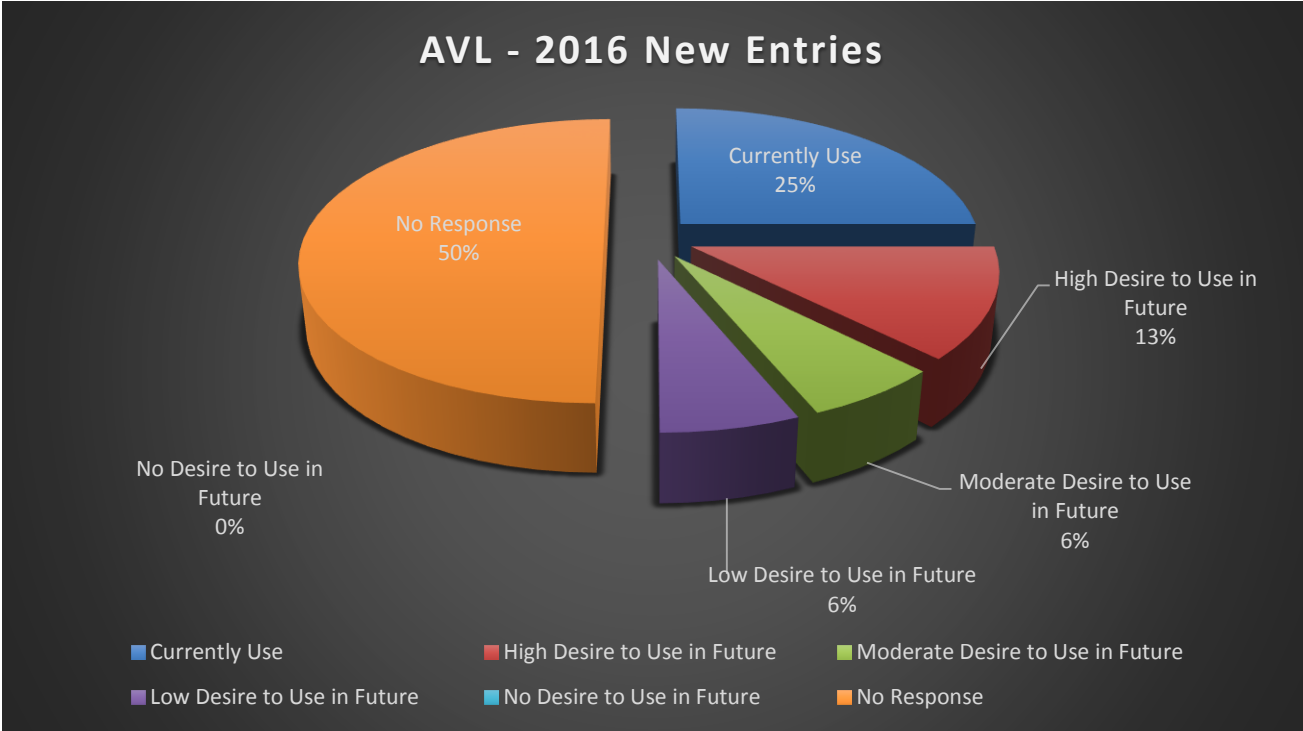
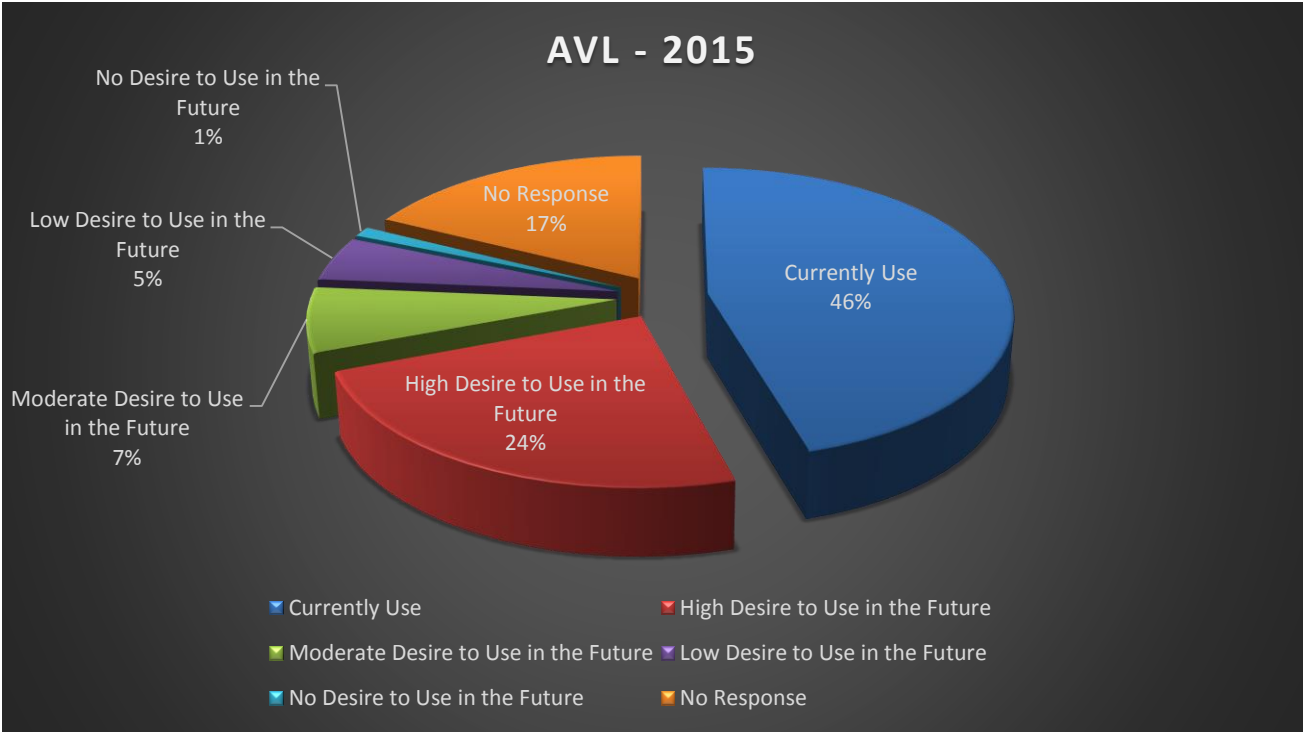


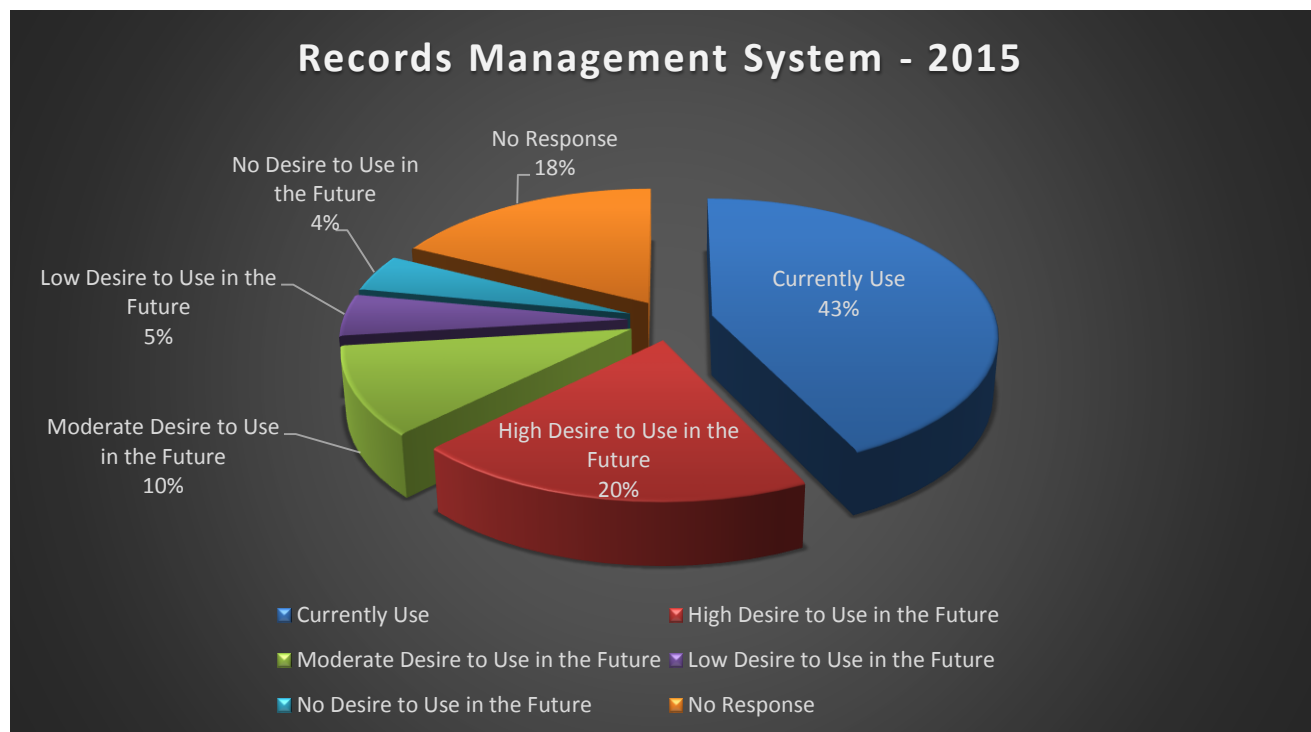
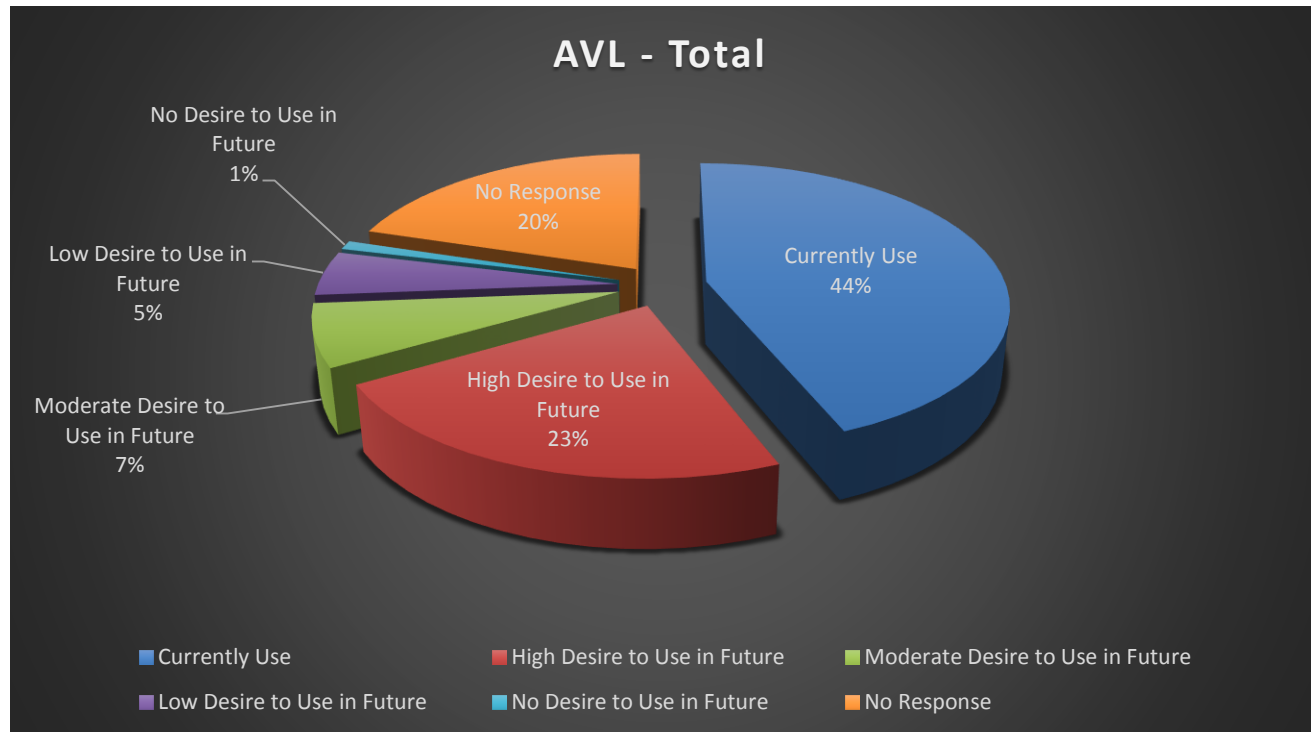
Text Messaging, One-Way Notifications - 2016 New Entries



Text Messaging, One-Way Notifications - Total

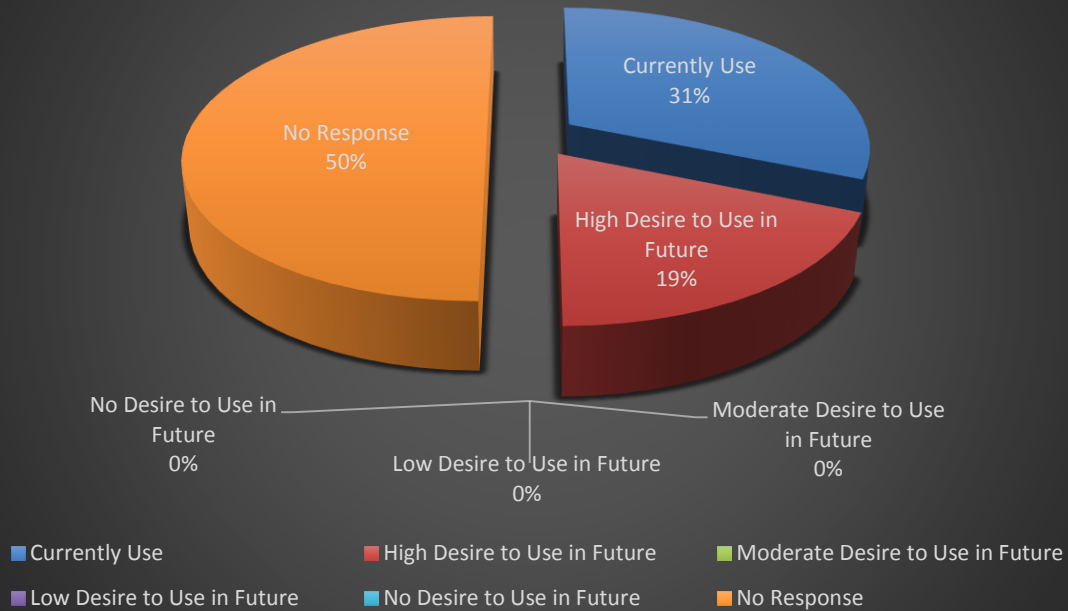




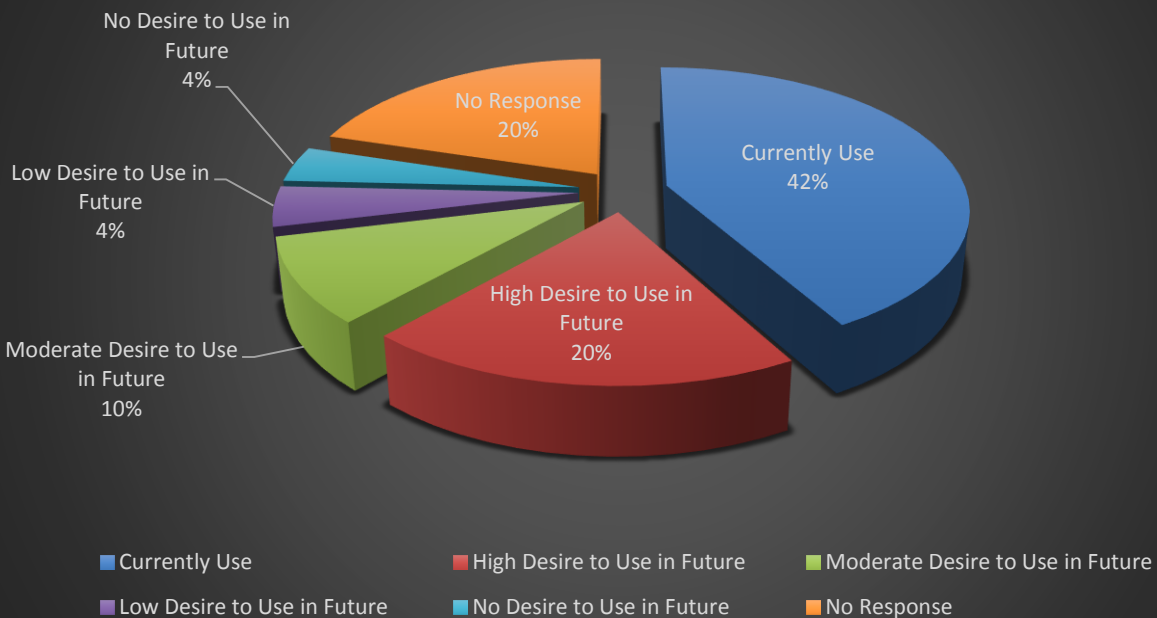


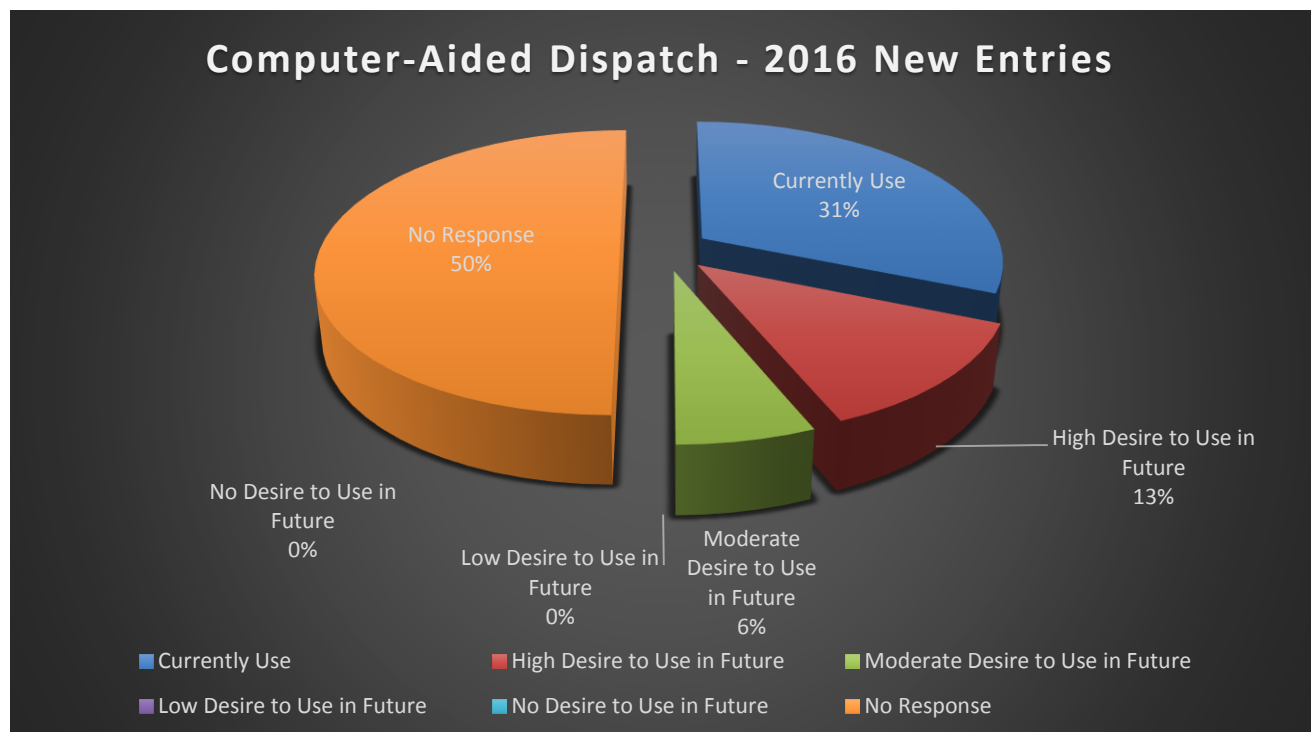
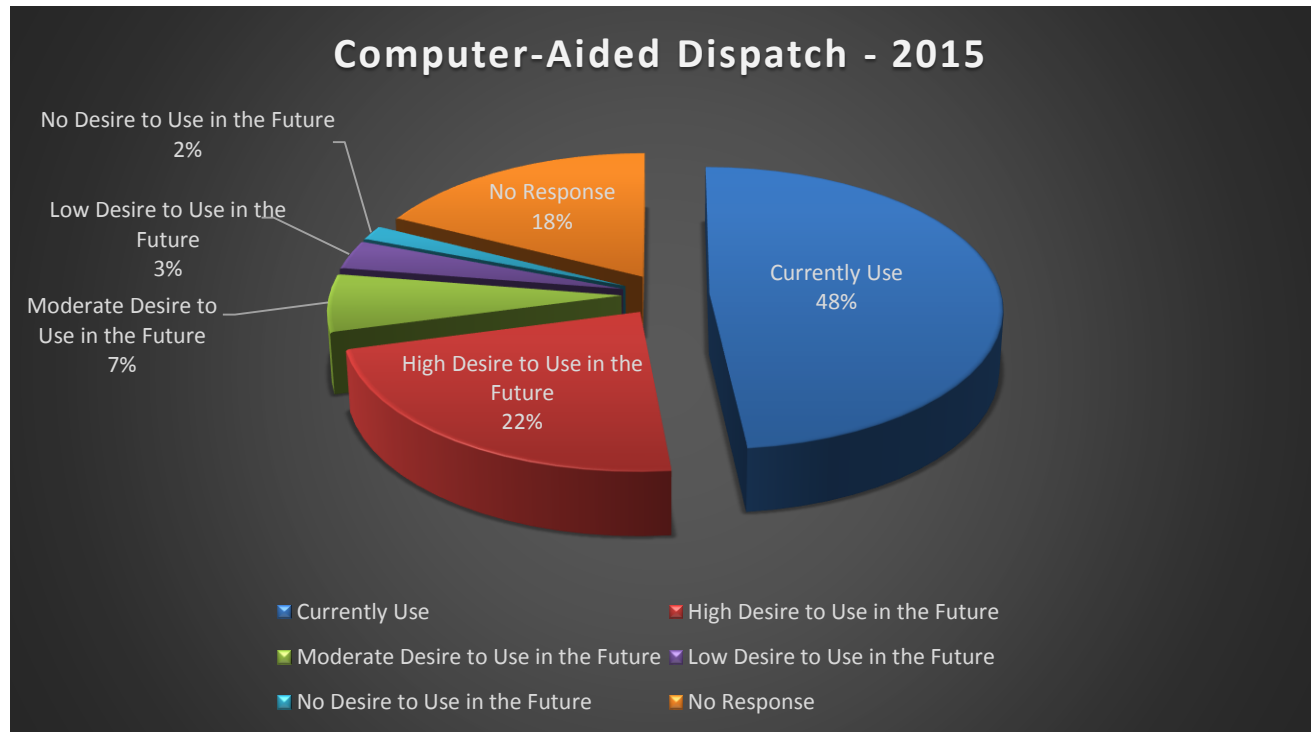


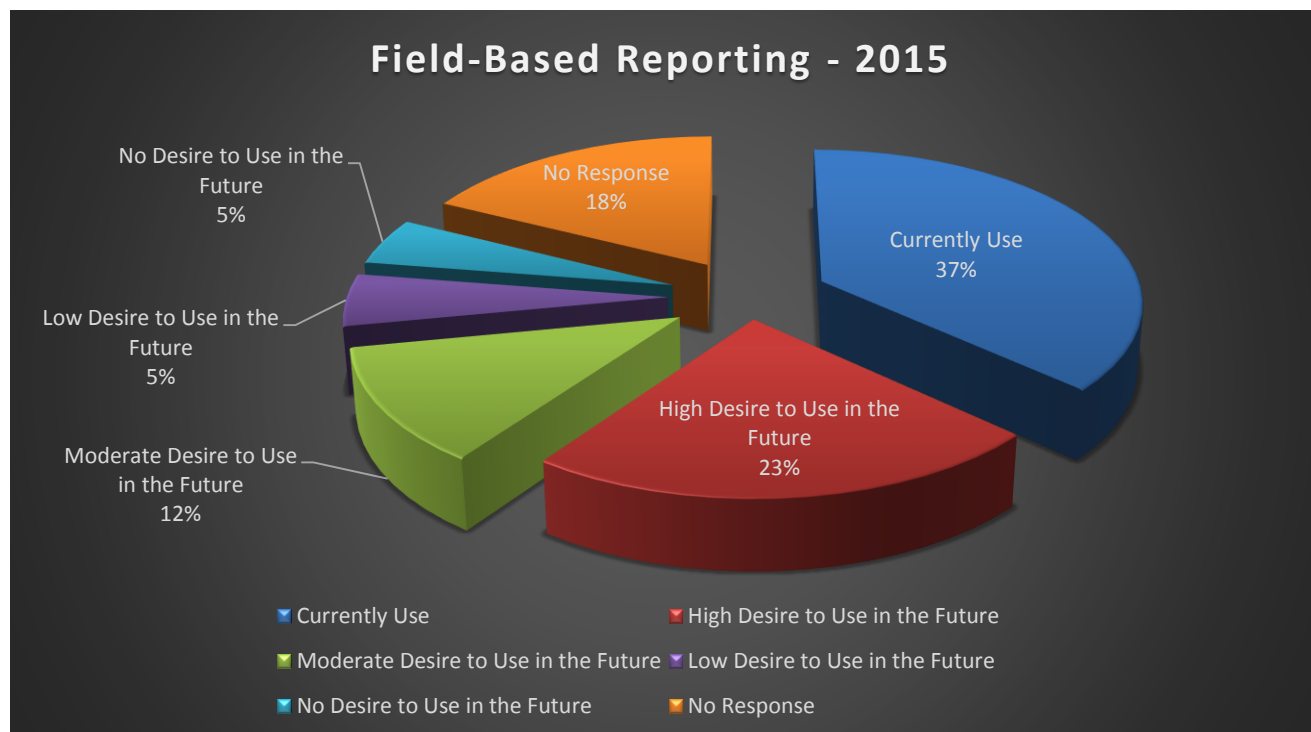
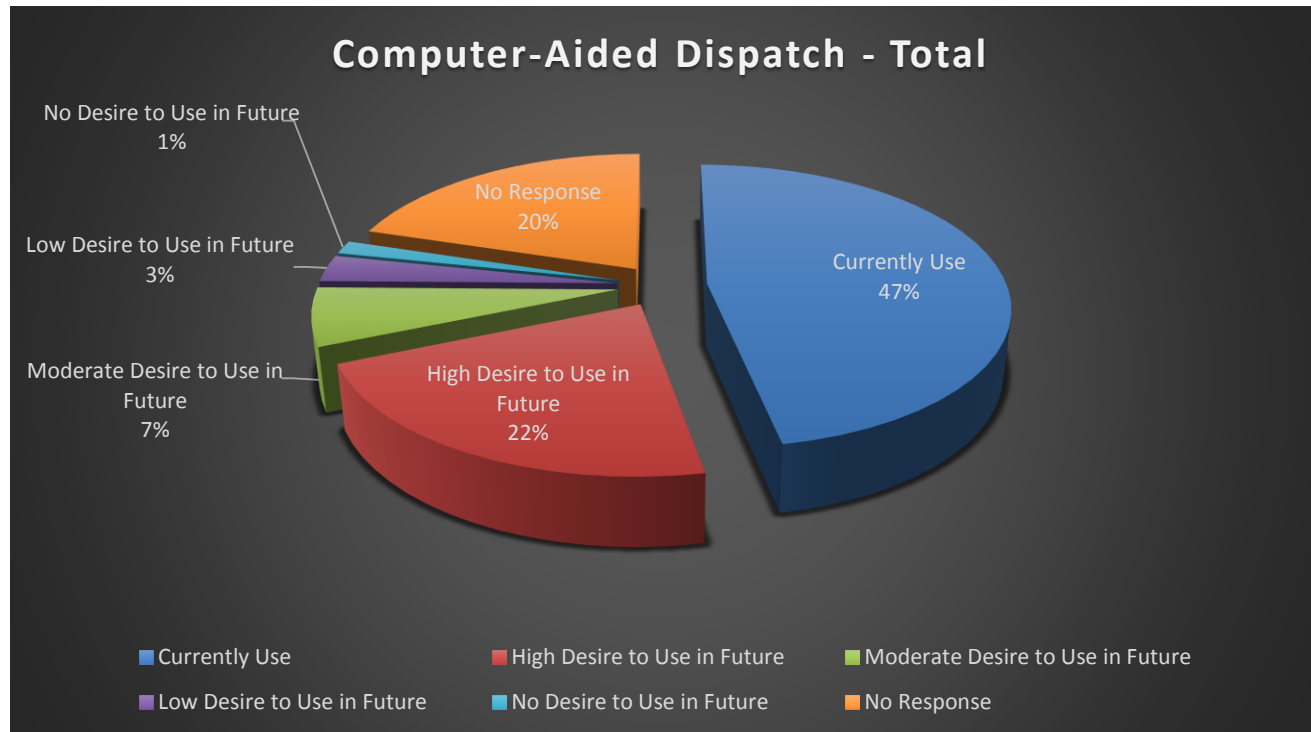
Records Management Systems - 2016 New Entries



Records Management Systems - Total

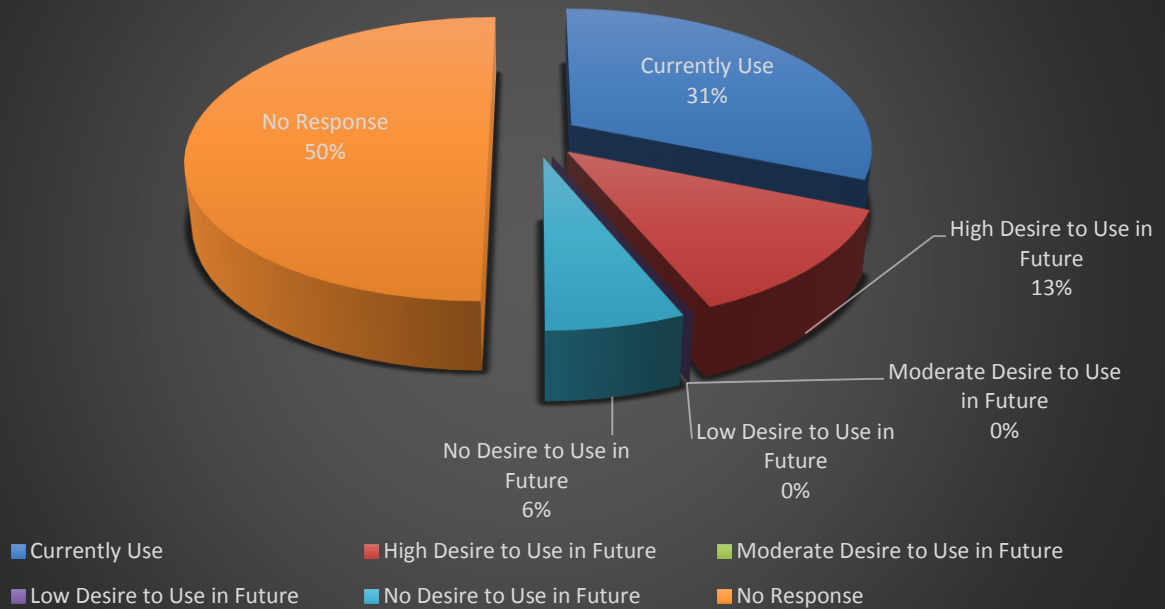




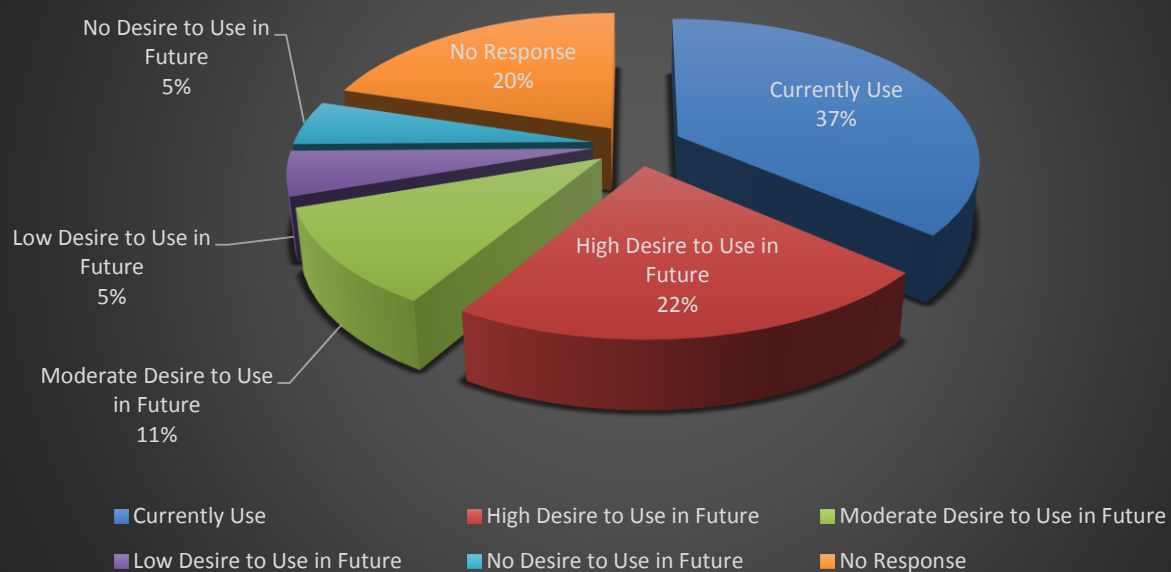




Field-Based Reporting - 2016 New Entries

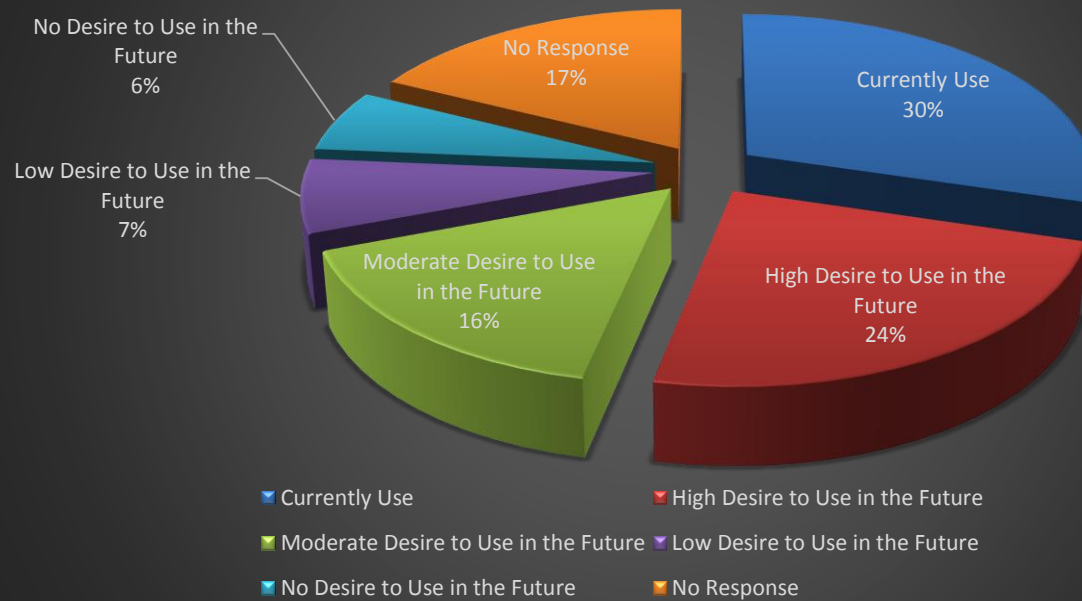


Field-Based Reporting - Total

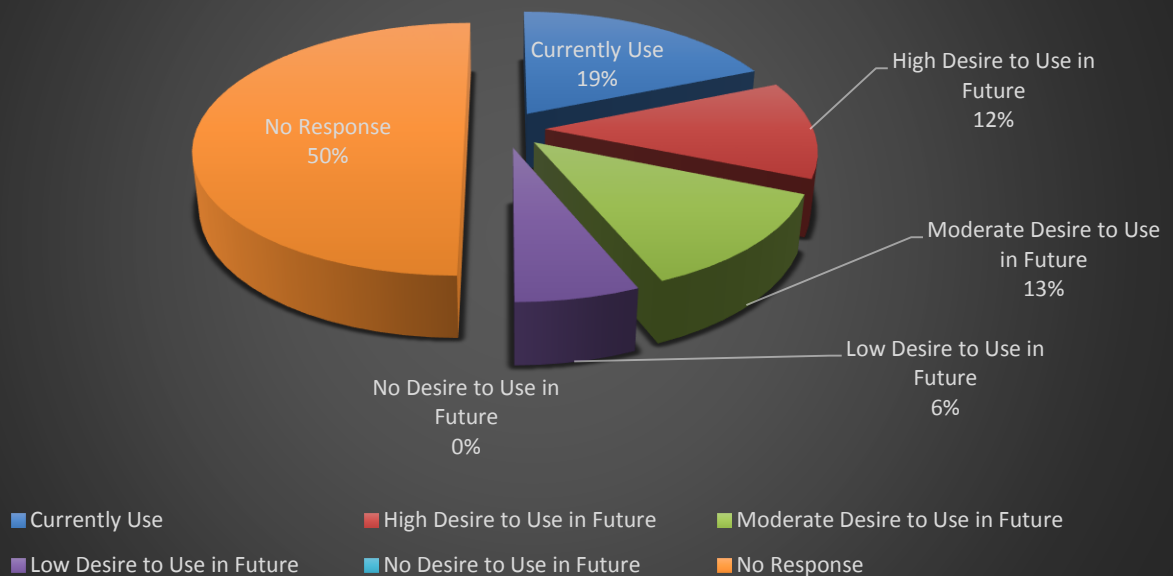




Small File Transfers (Under 1 MB) - 2015

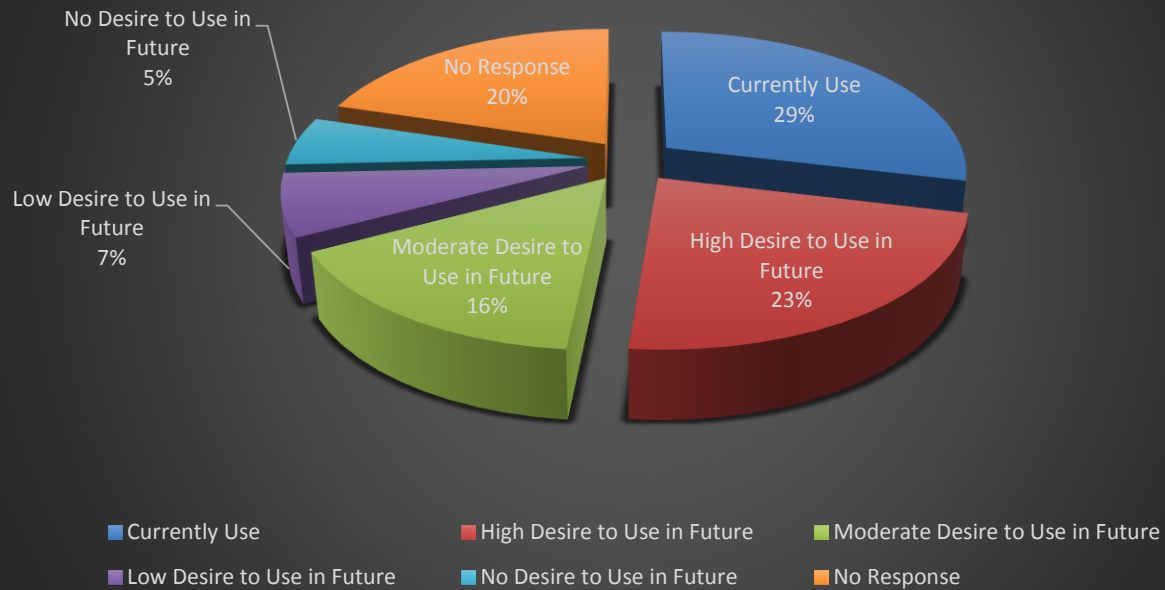


Small File (Under 1 MB) Transfers - 2016 New Entries

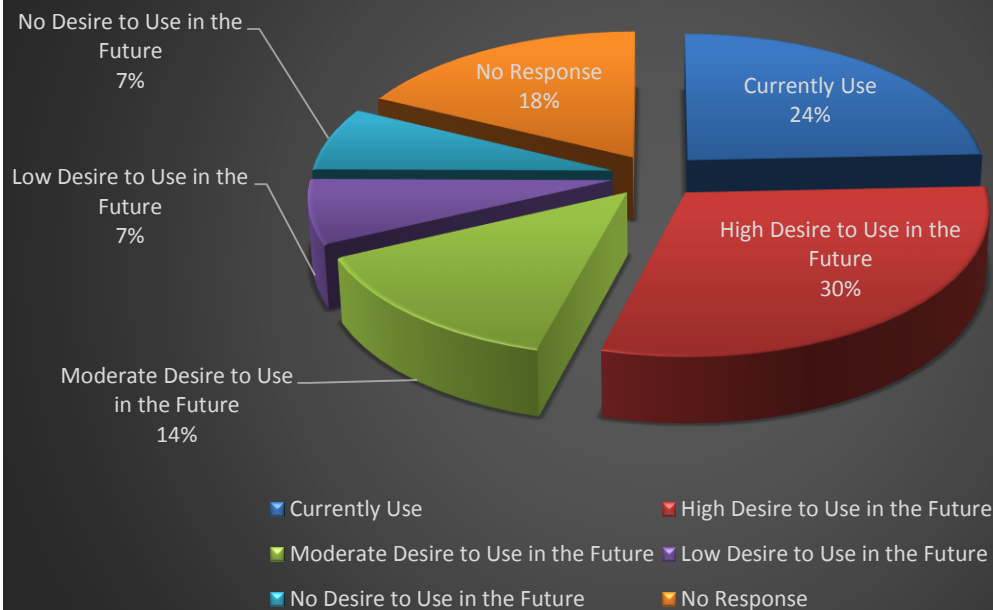




Small File (Under 1 MB) Transfers - Total

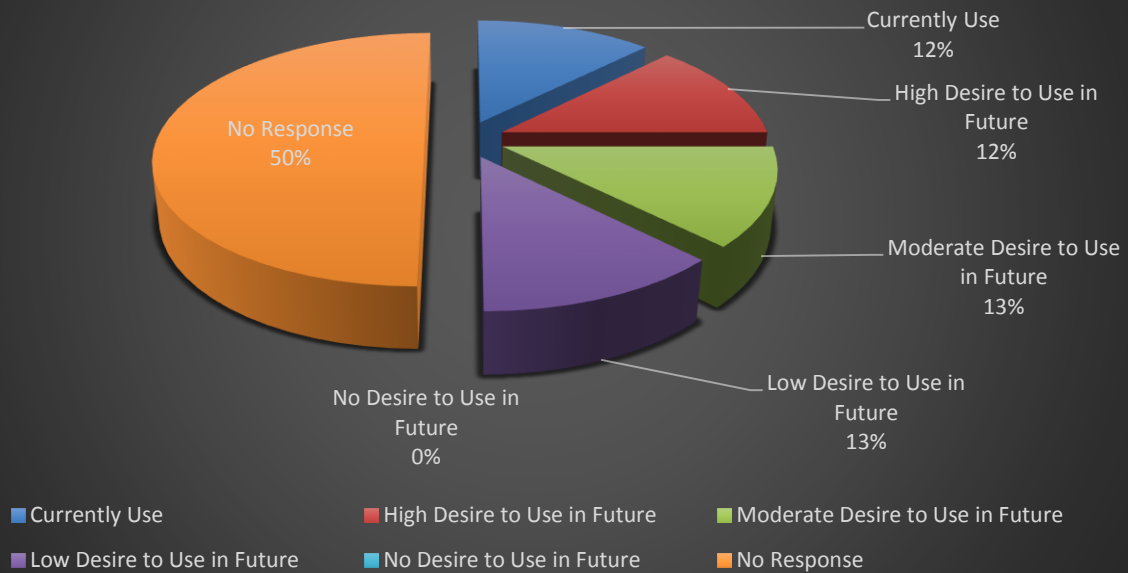


Large File Transfers (Over 1 MB) - 2015

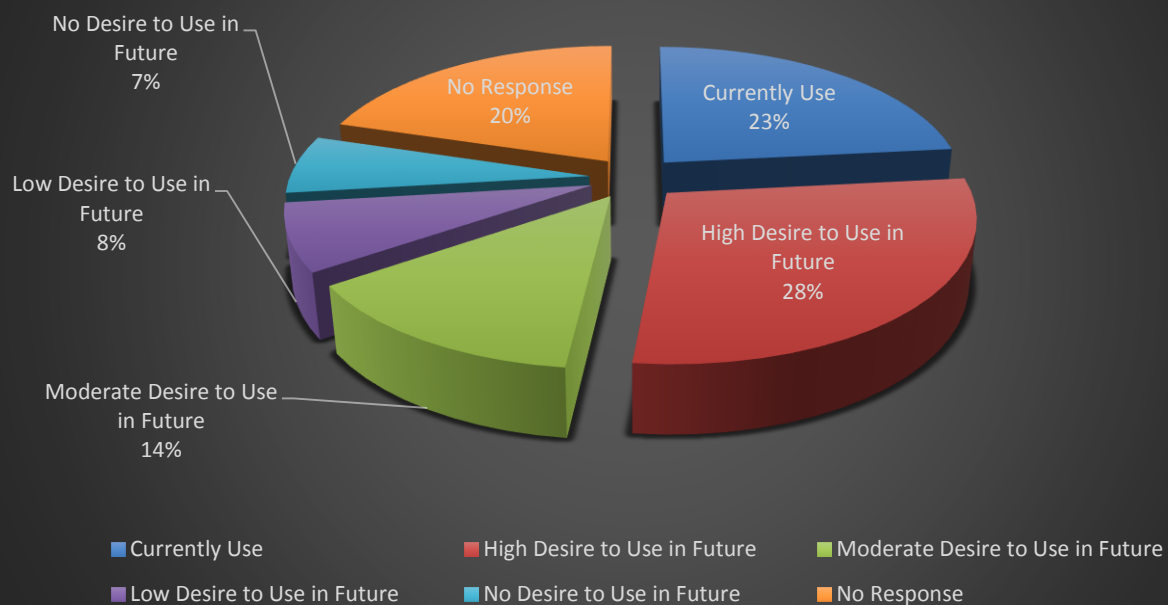




Large File (Over 1 MB) Transfers - 2016 New Entries

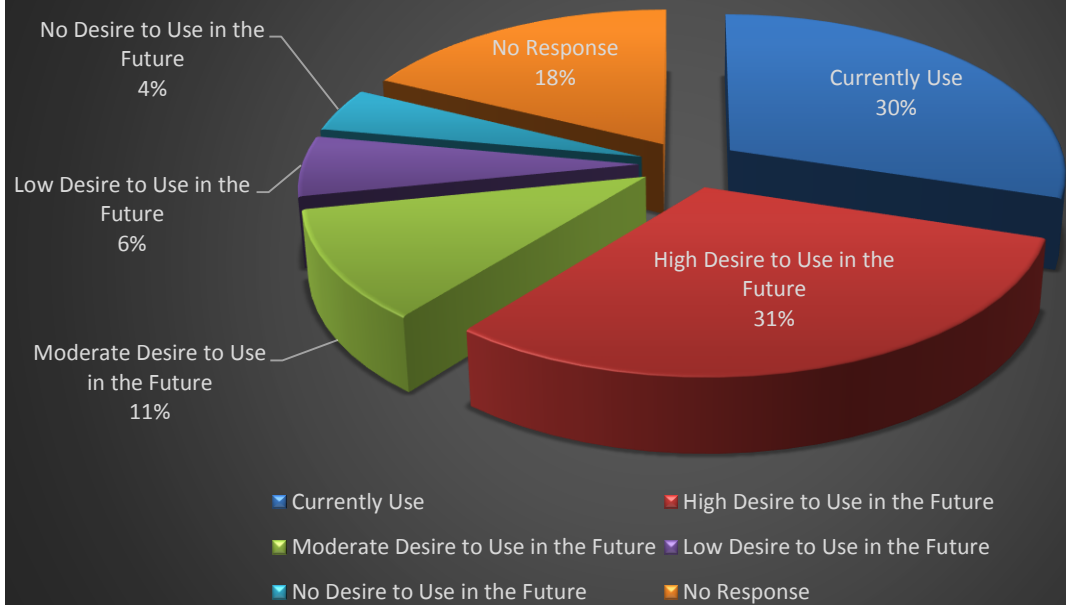


Large File (Over 1 MB) Transfers - Total

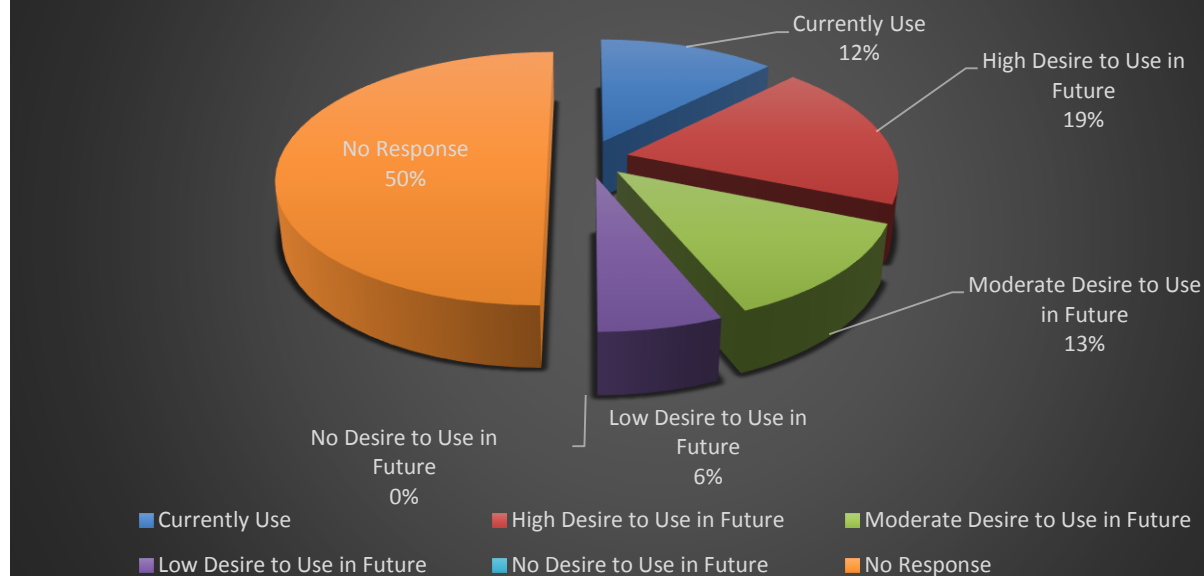




Geographic Information System - 2015

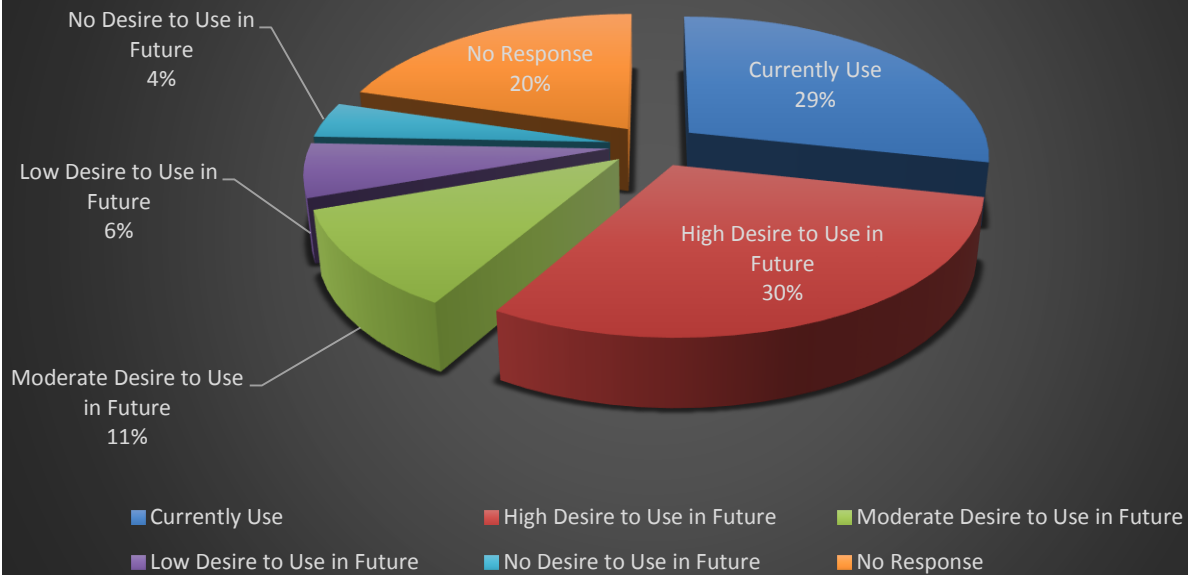


Geographic Information System - 2016 New Entries

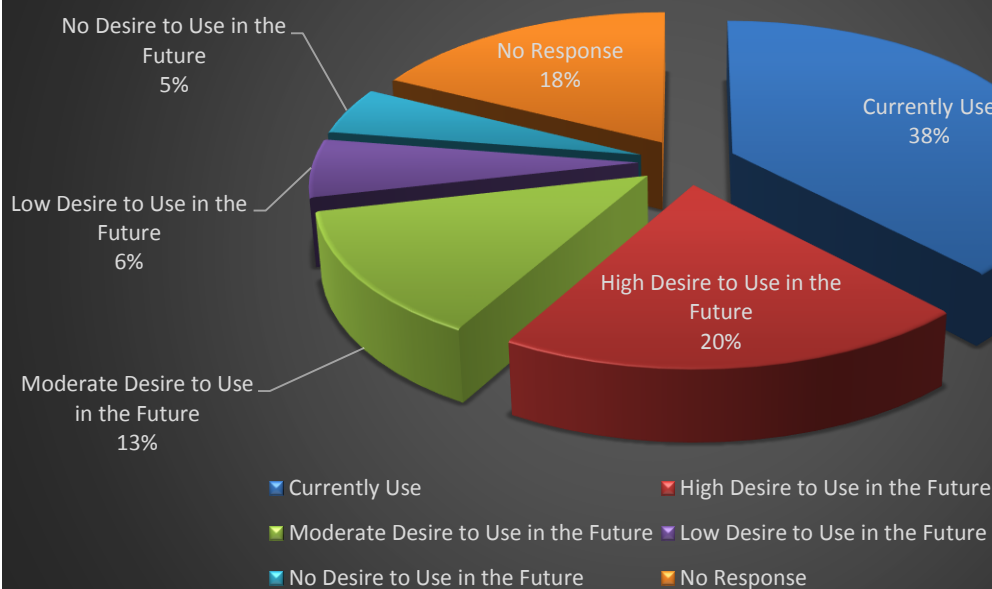




Geographic Information System - Total

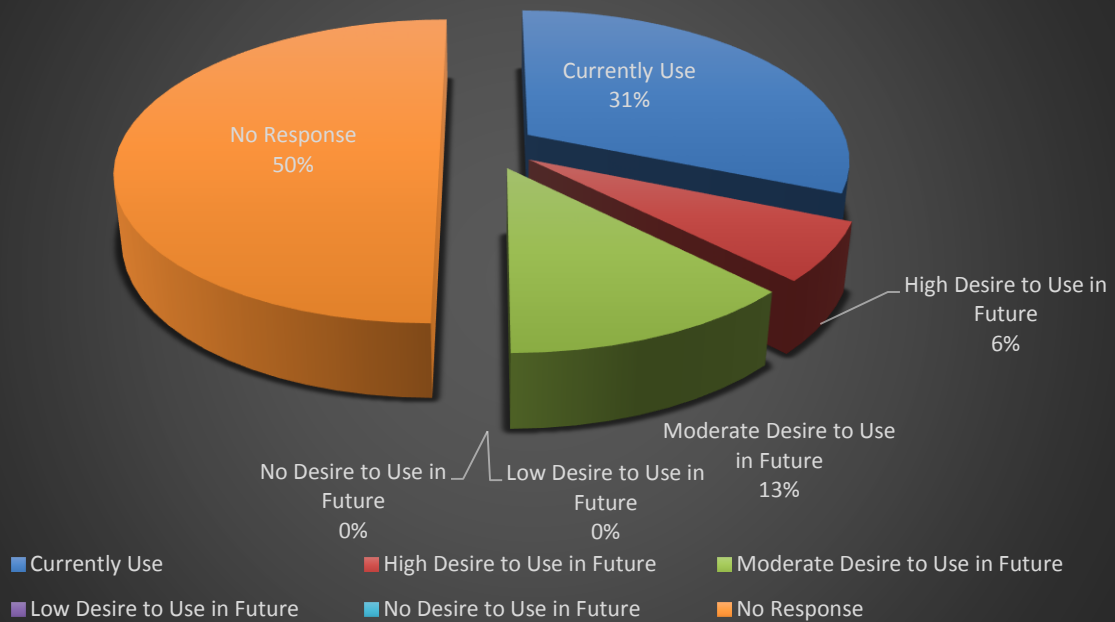


Internet Browser Access - 2015

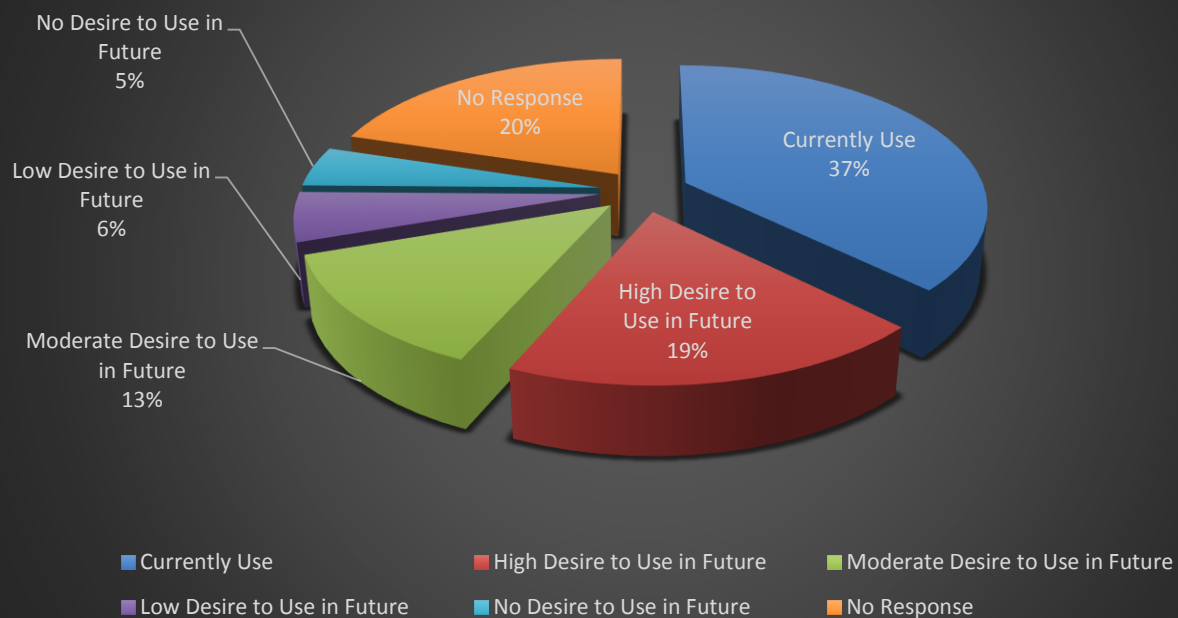




Internet Browser Access - 2016 New Entries

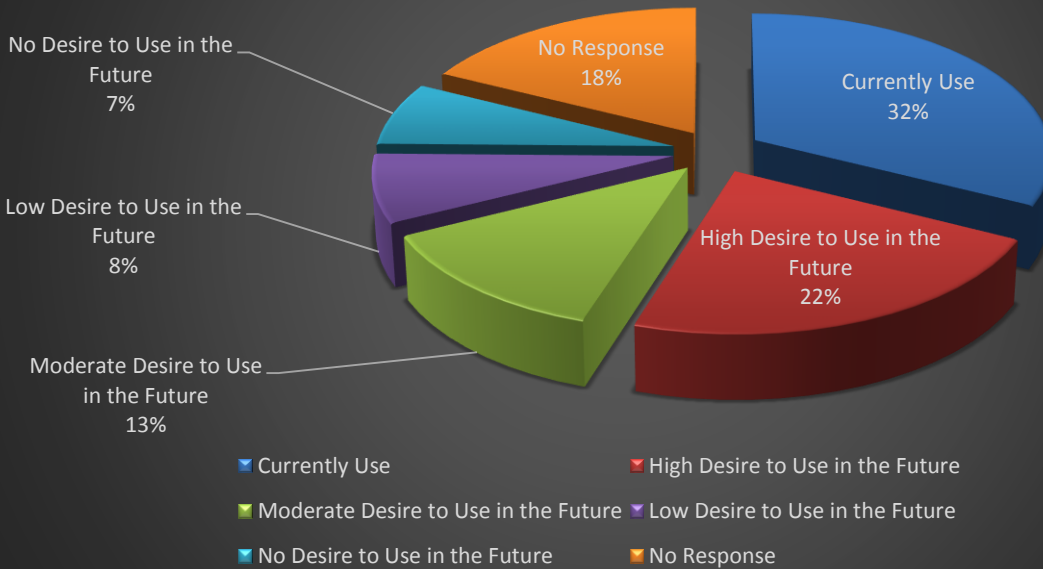


Internet Browser Access - Total

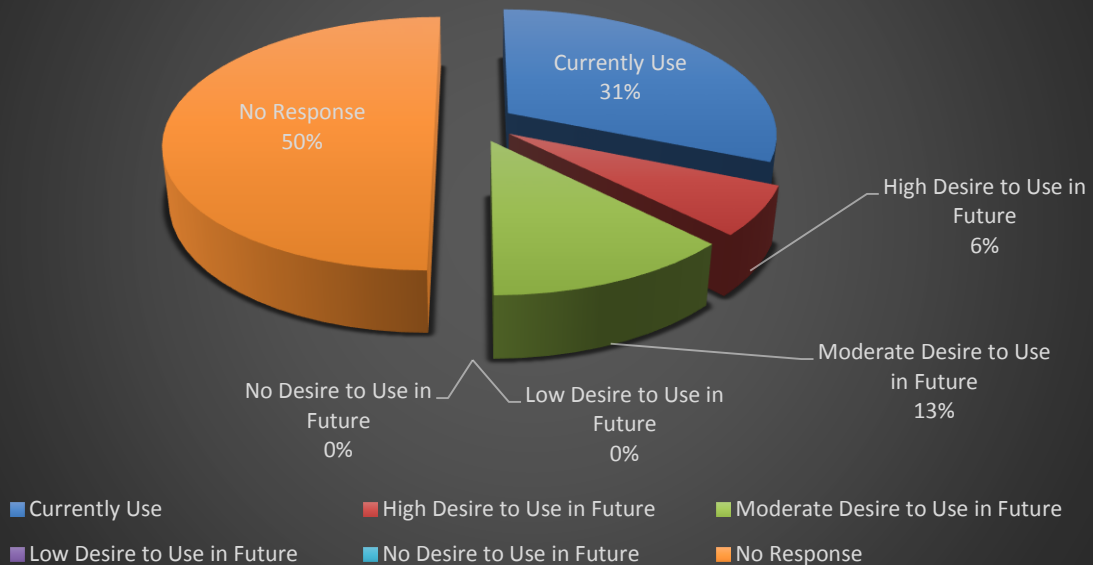




Intranet Access/Virtual Private Network to Home Network - 2015

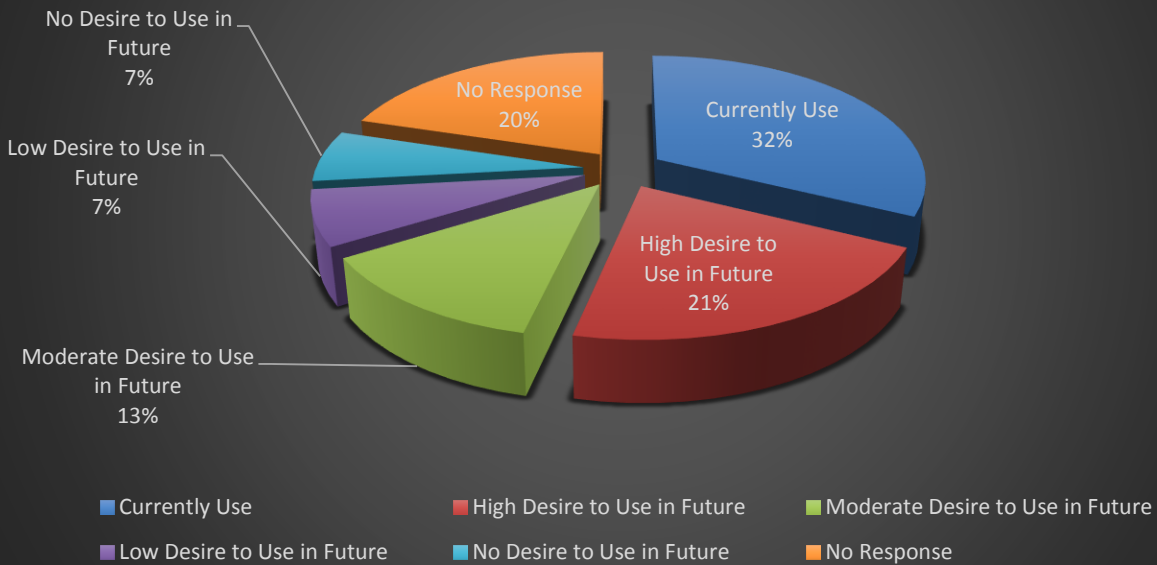


Internet Access/Virtual Private Network to Home Network - 2016 New Entries

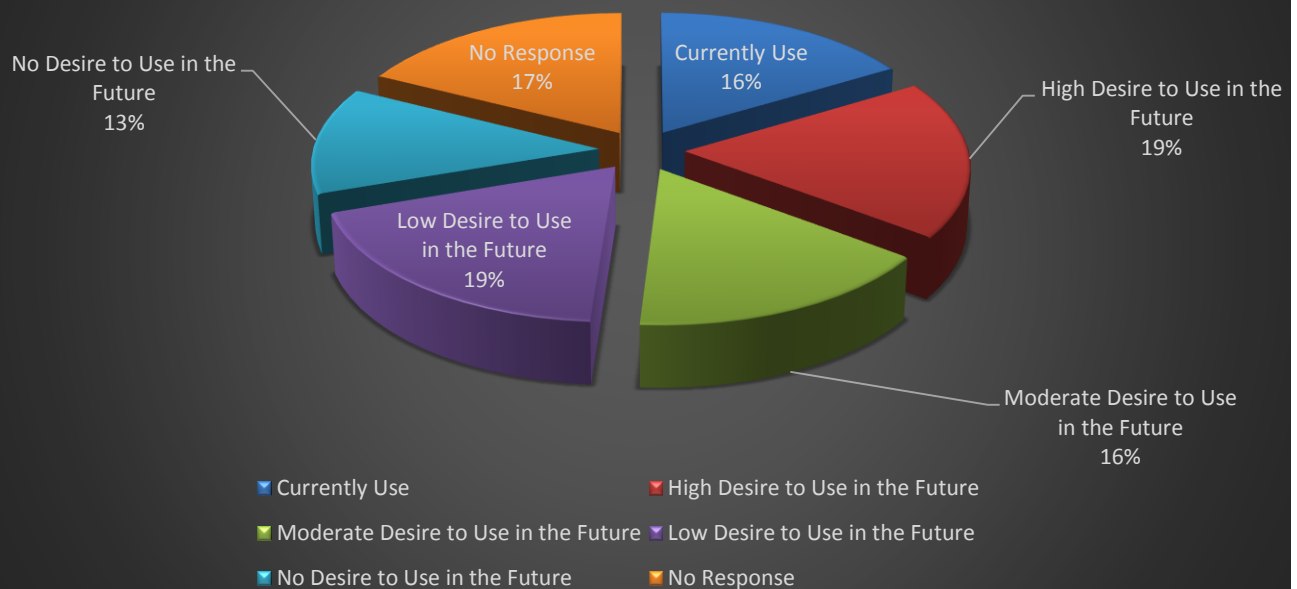




Internet Access/Virtual Private Network to Home Network - Total

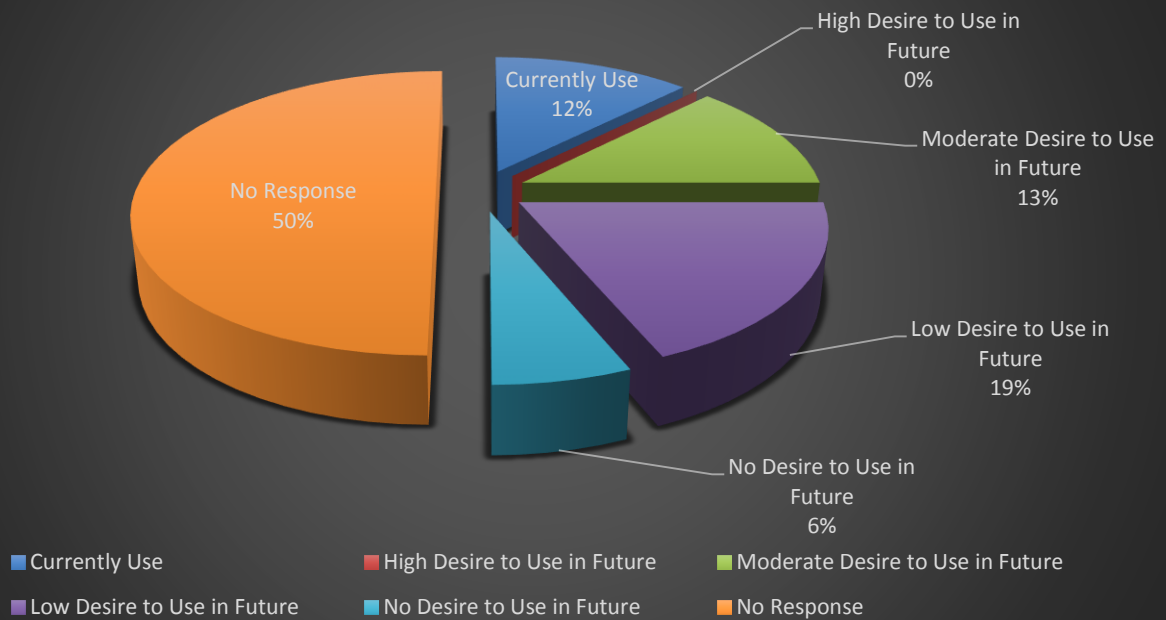


Tactical Chat Rooms - 2015

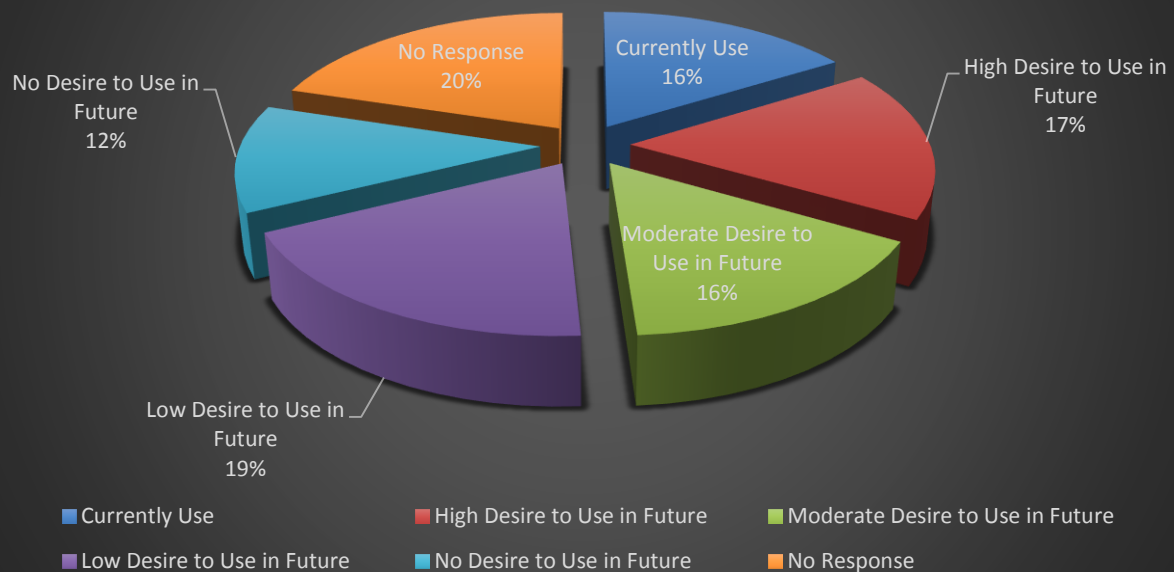




Tactical Chat Rooms - 2016 New Entries

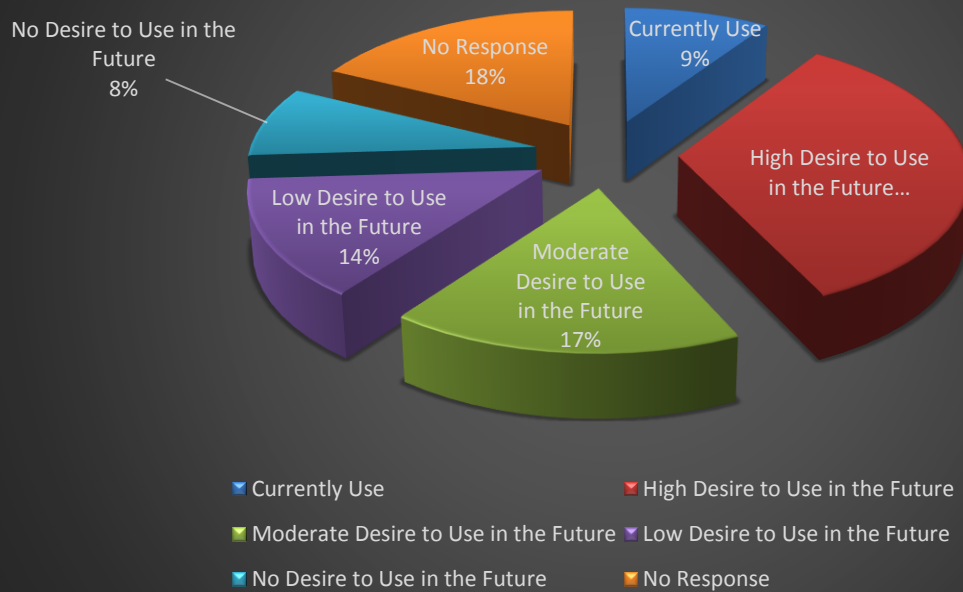


Tactical Chat Rooms - Total

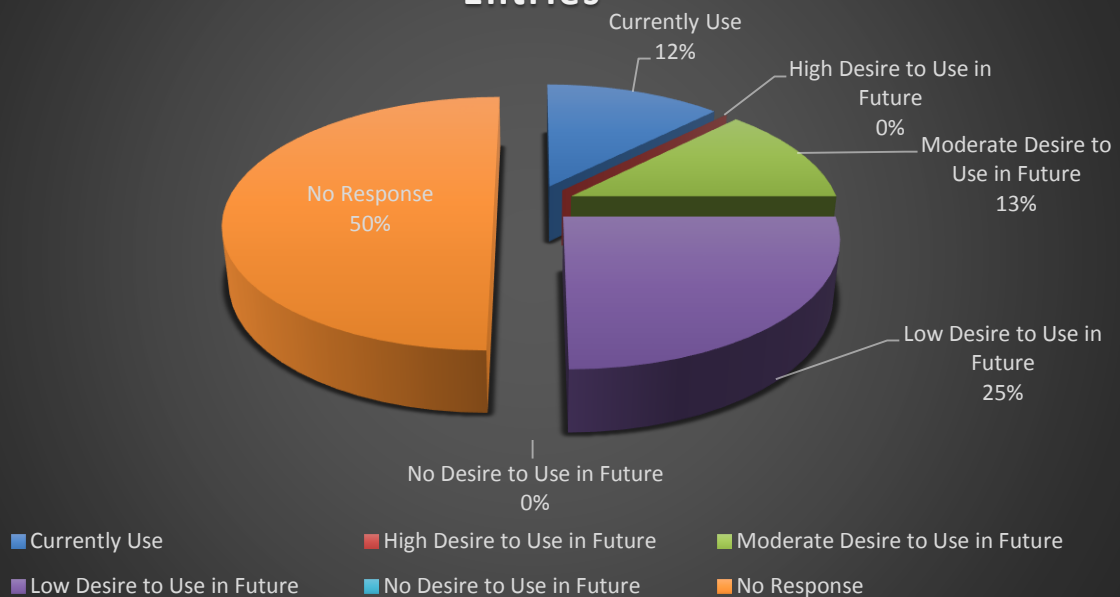




Transmission of Low-Quality Video - 2015

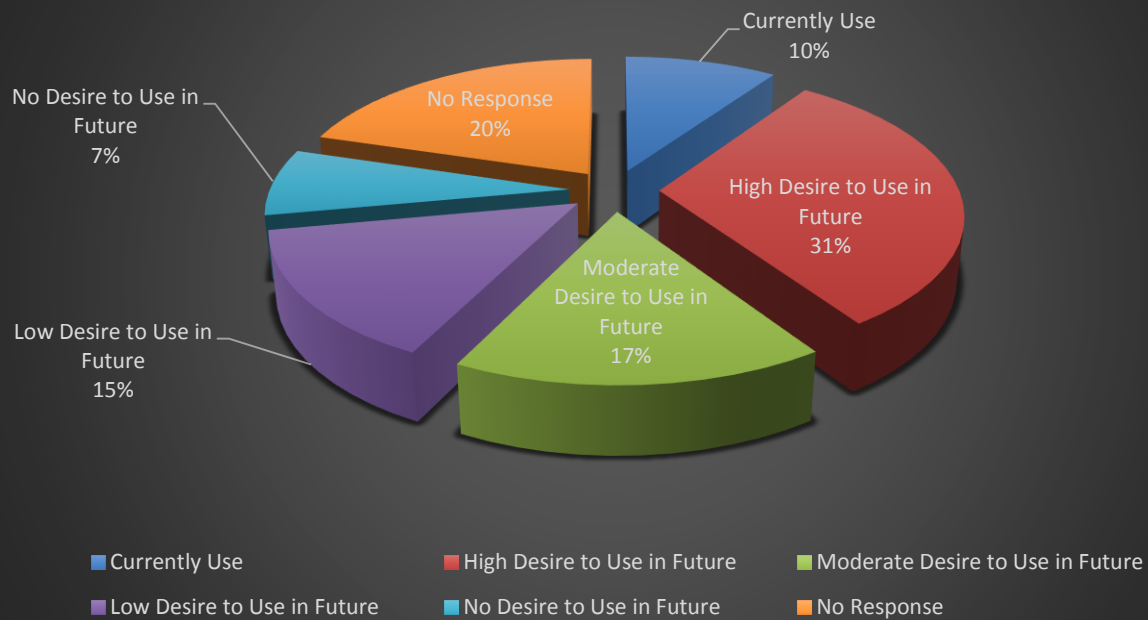


Transmission of Low-Quality Video - 2016 New Entries

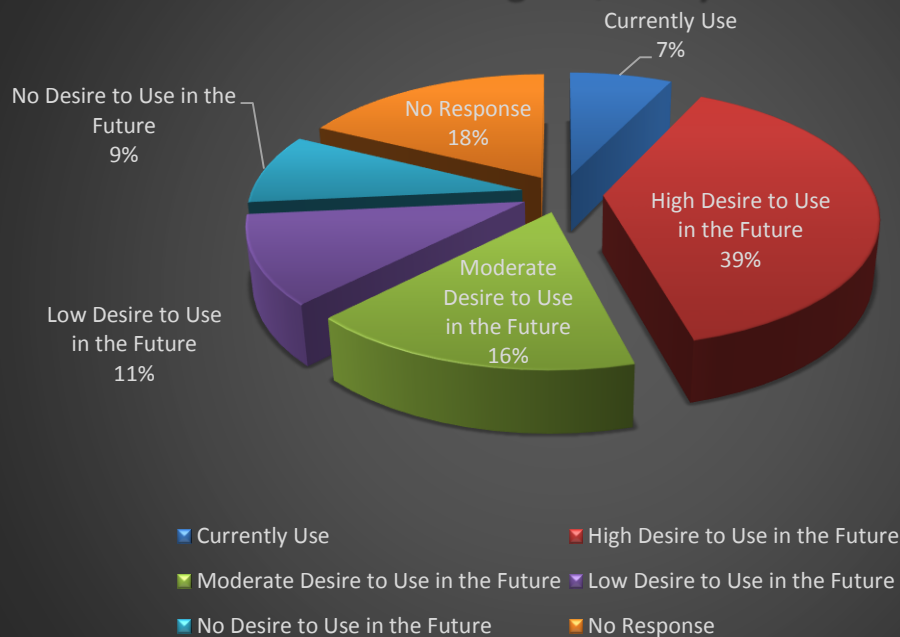




Transmission of Low-Quality Video - Total

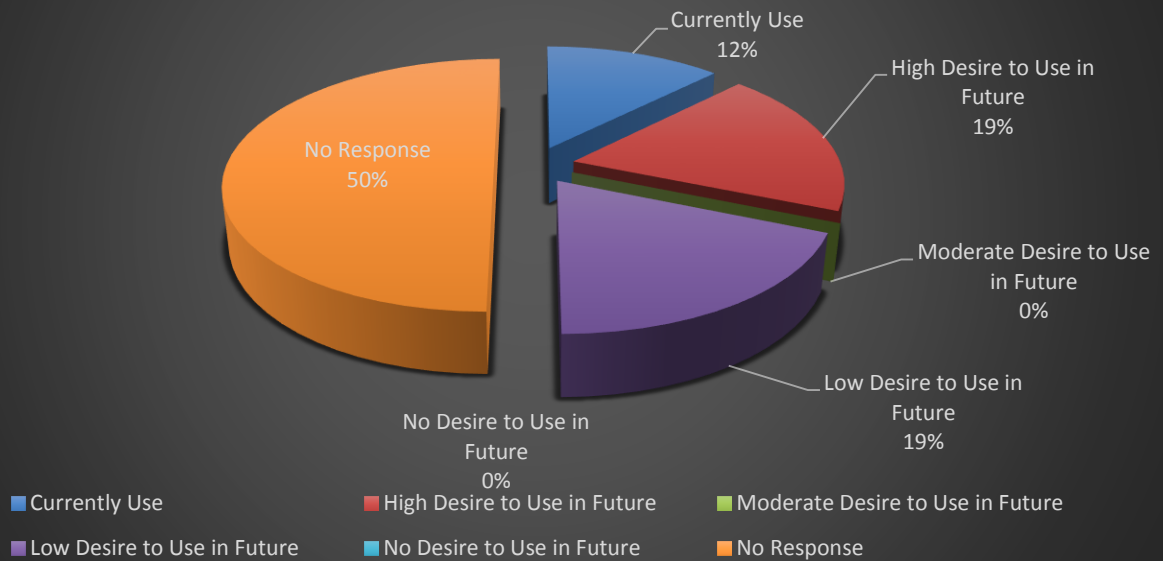


Transmission of High-Quality Video - 2015

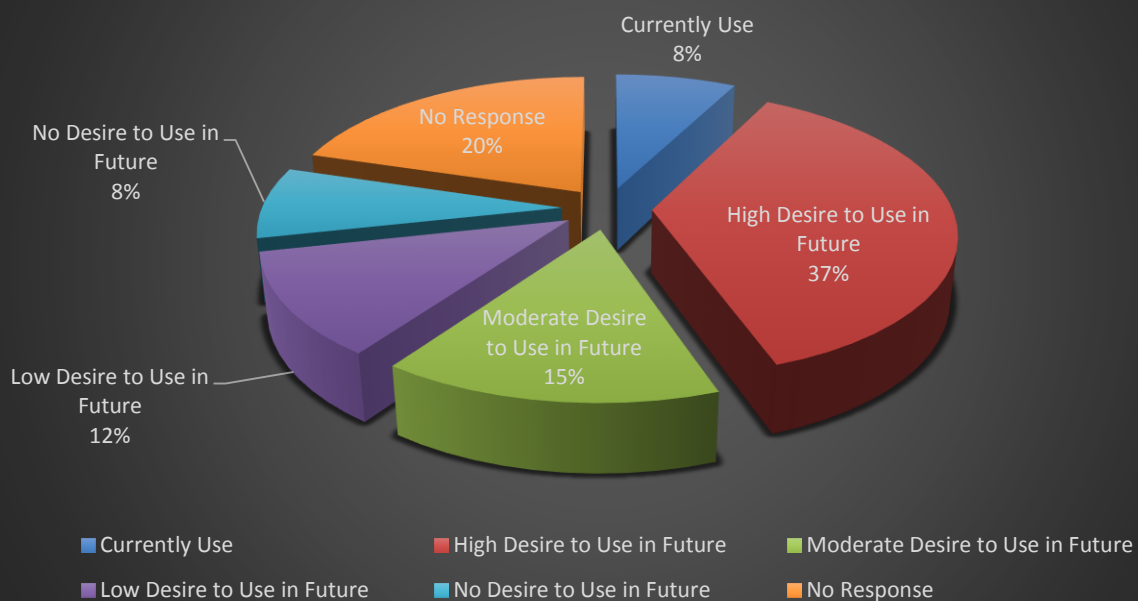


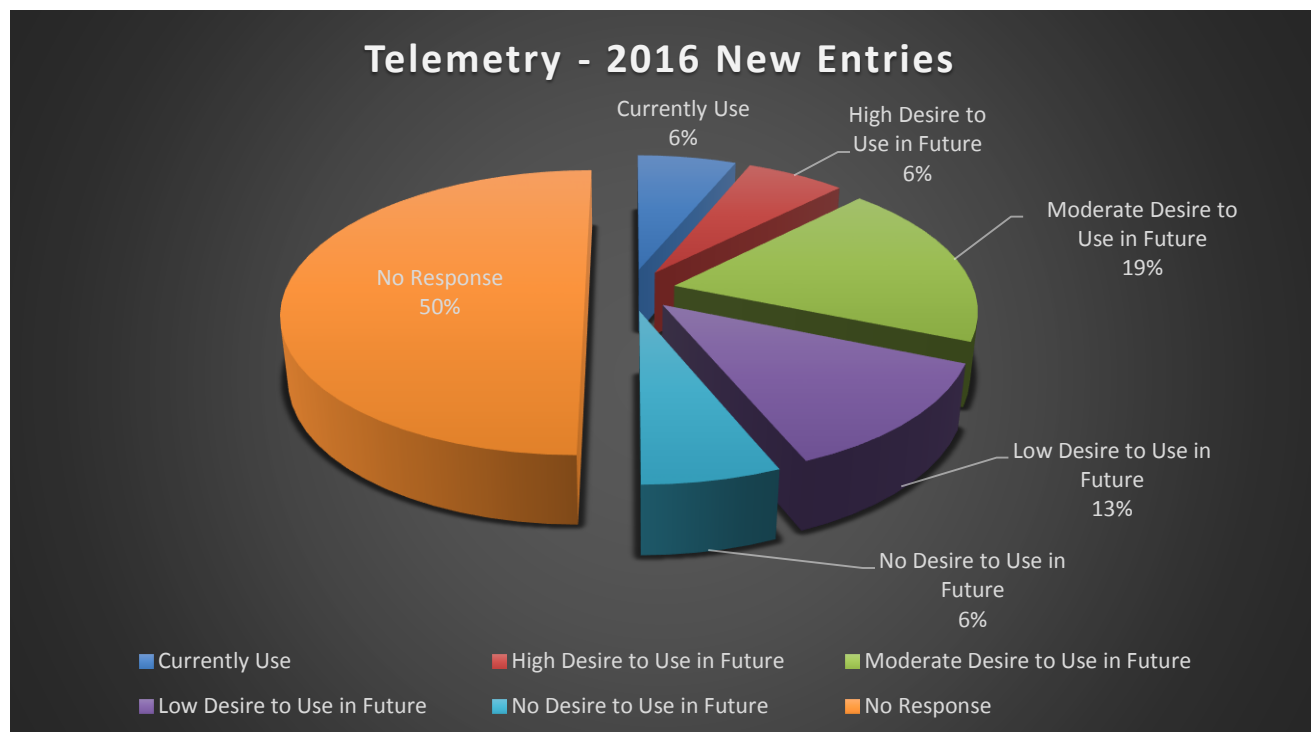
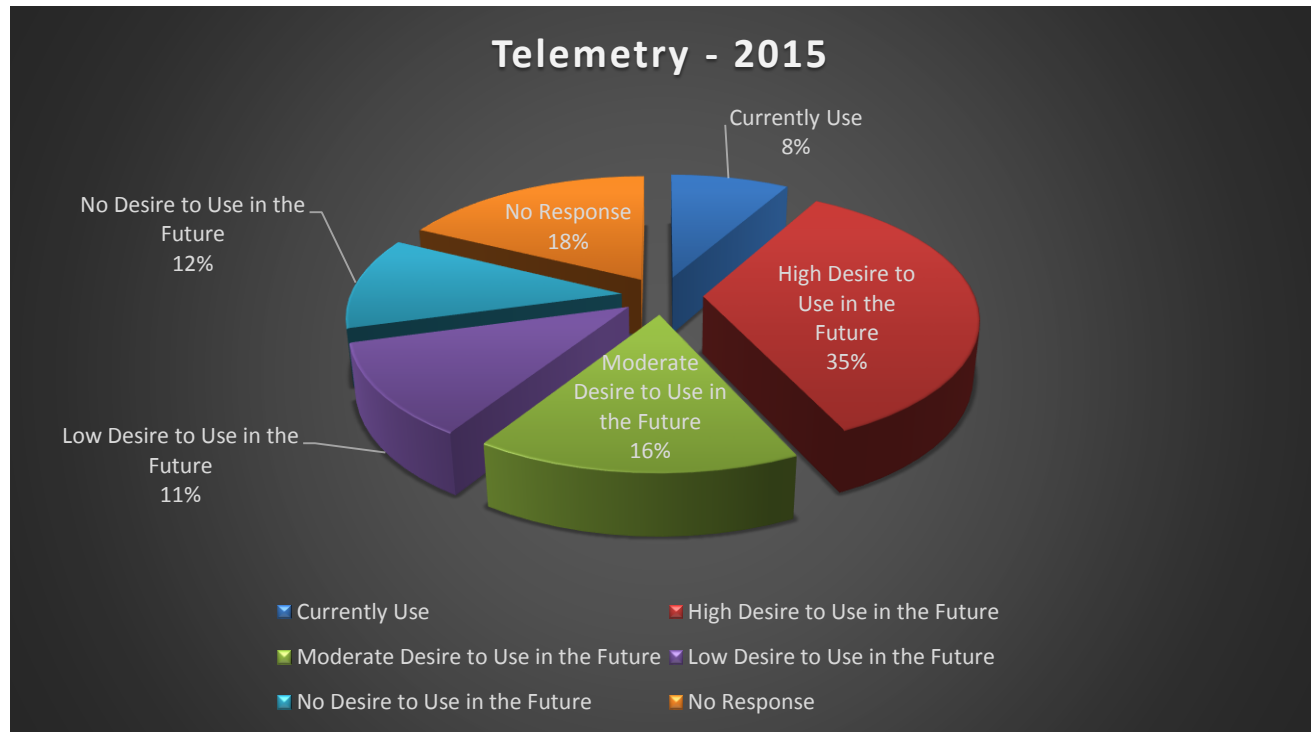


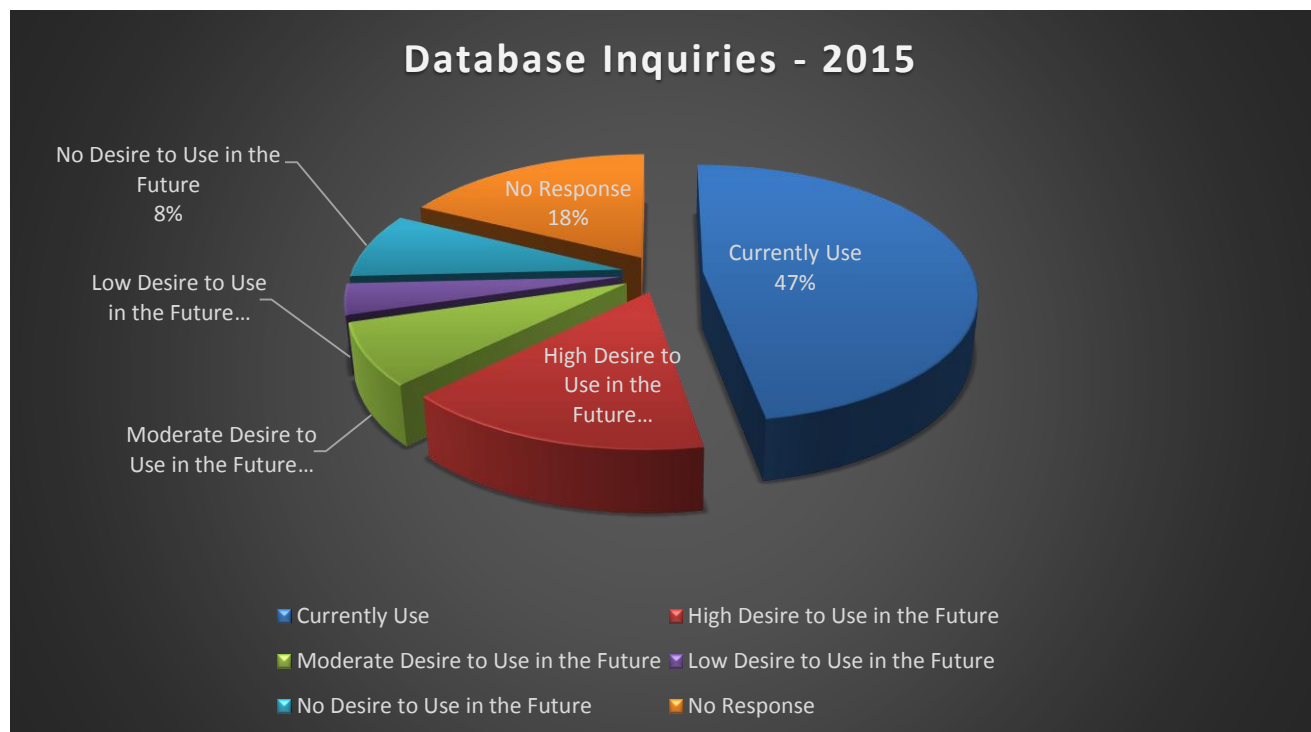
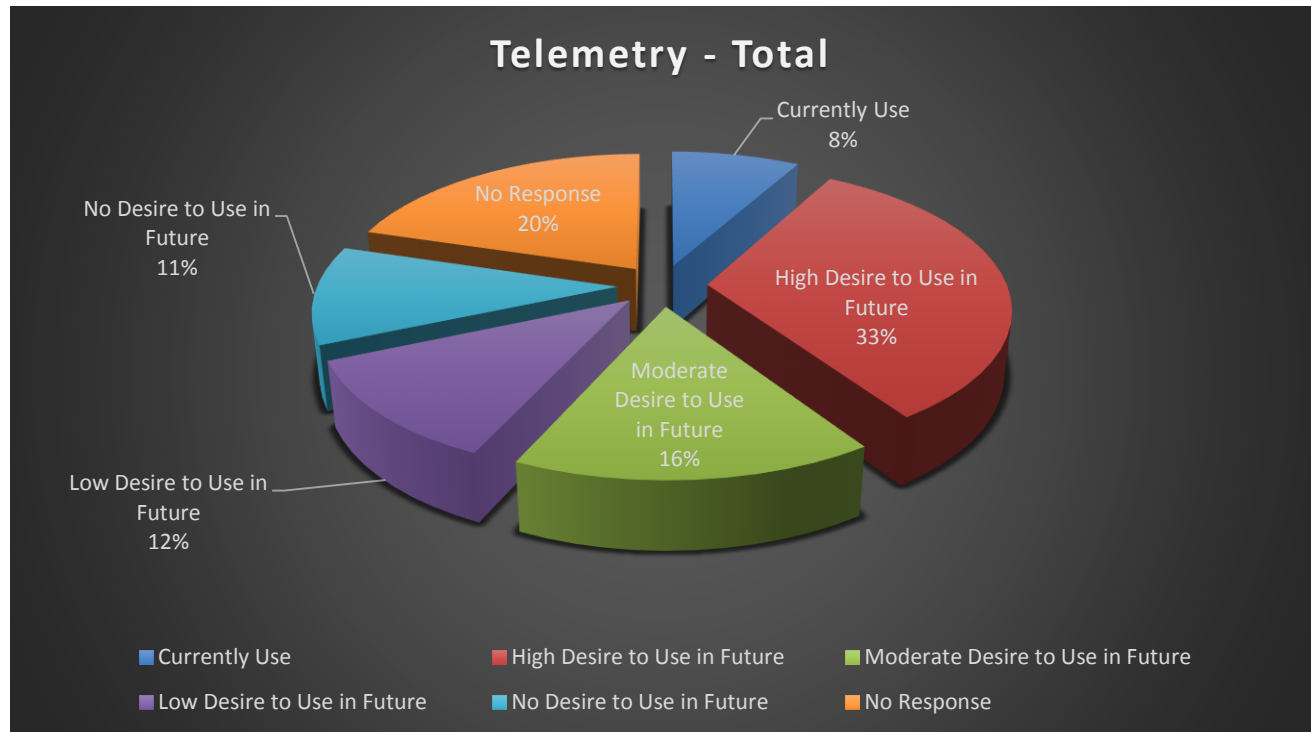
Transmission of High-Quality Video - 2016 New Entries



Transmission of High-Quality Video - Total

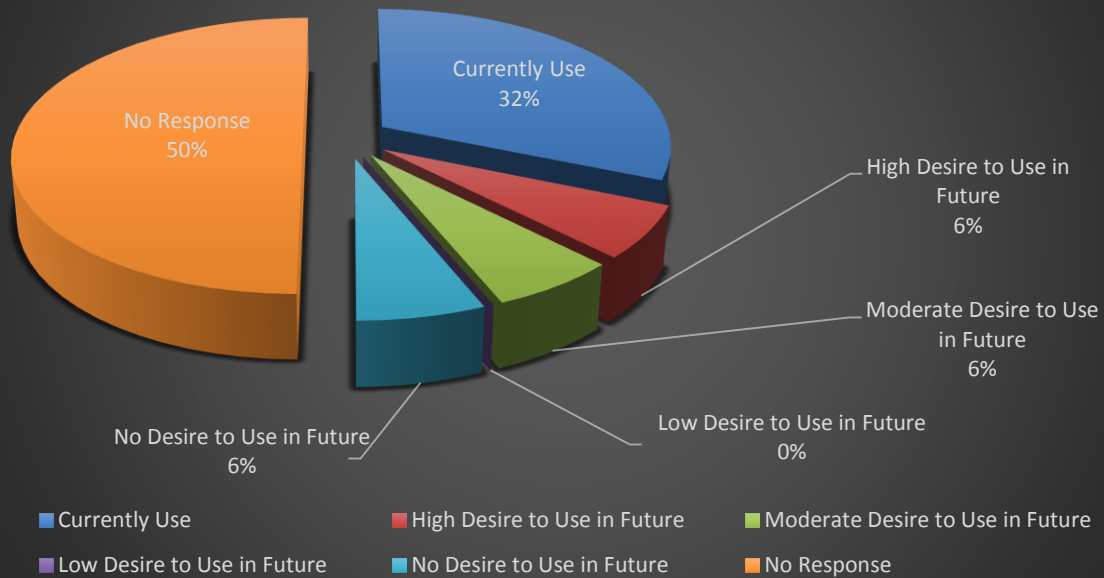




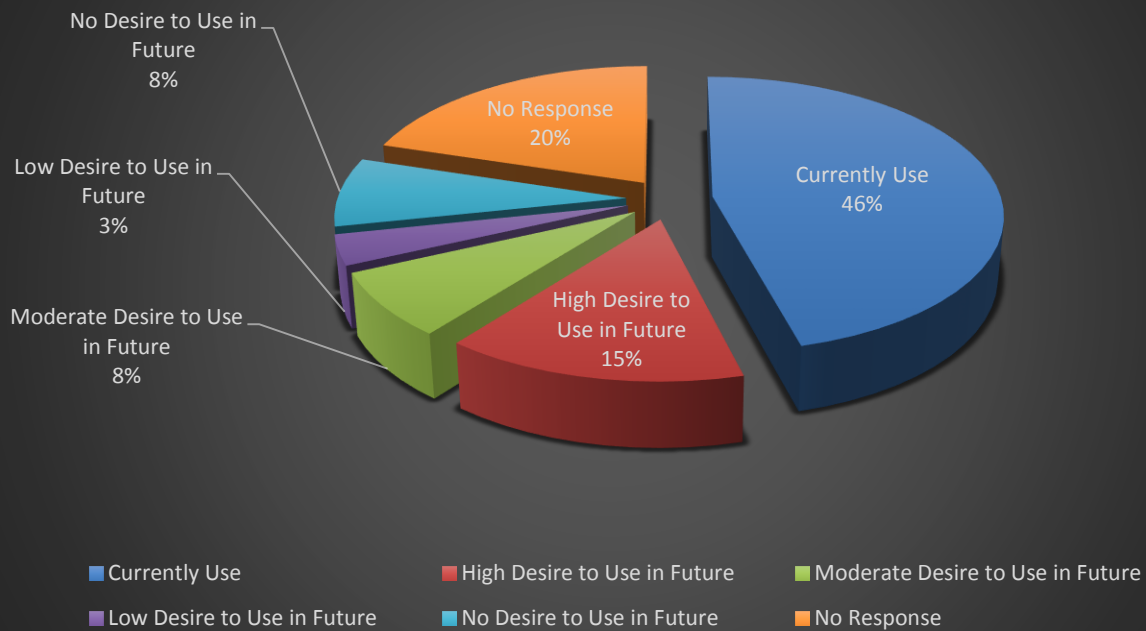




Database Inquiries - 2016 New Entries

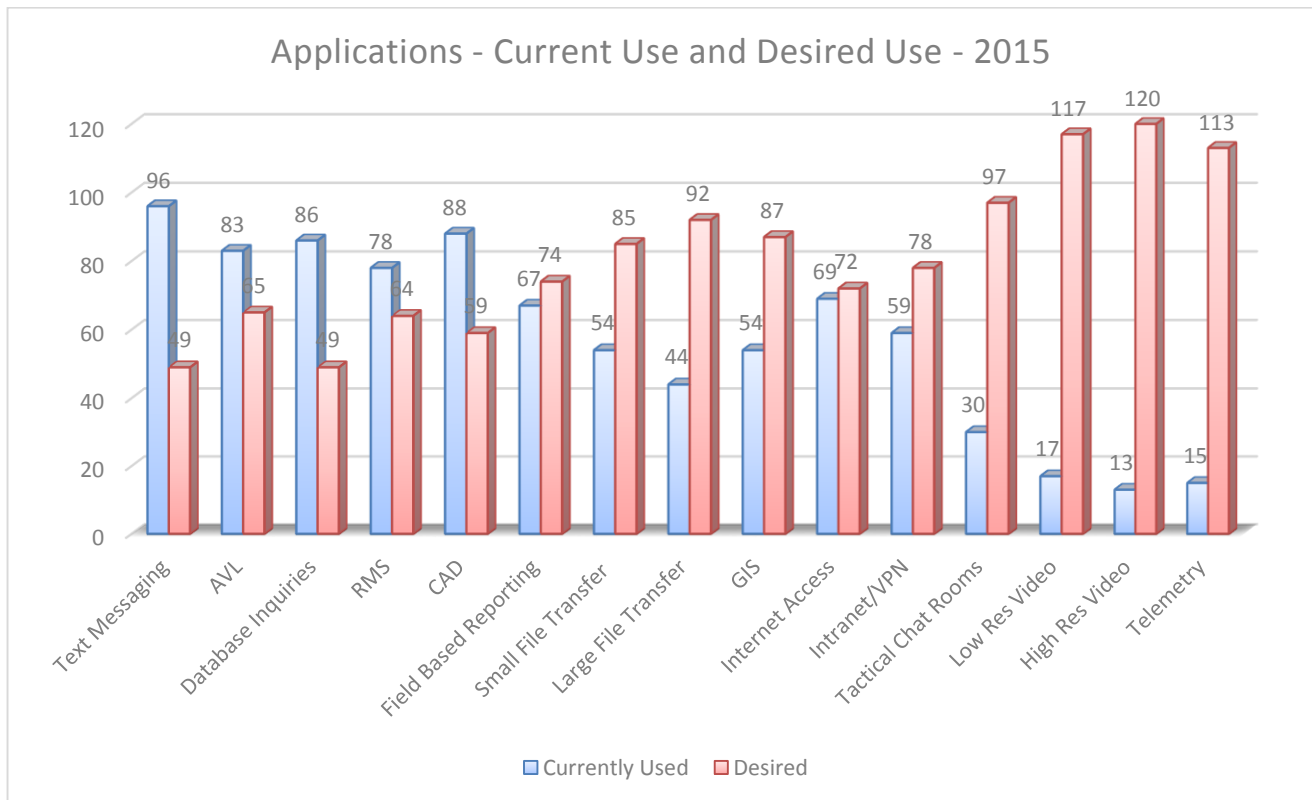


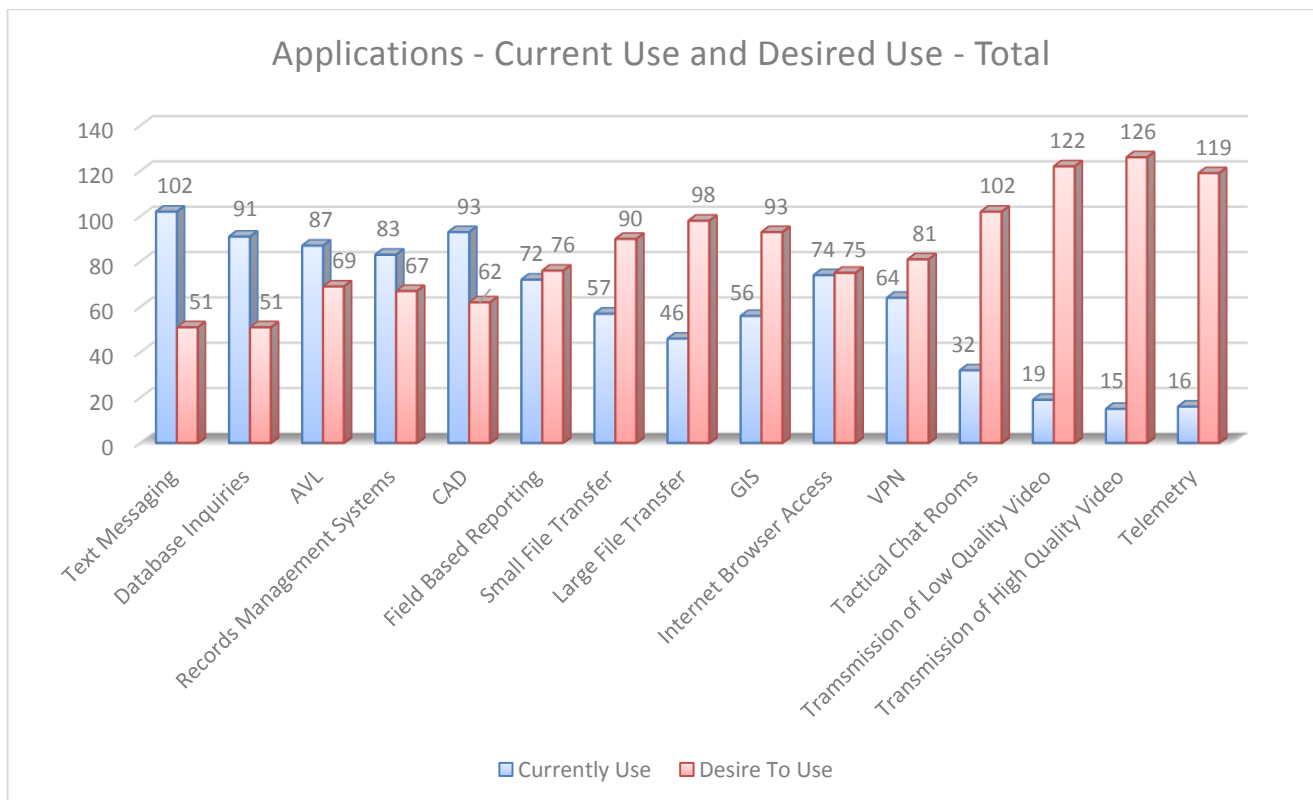
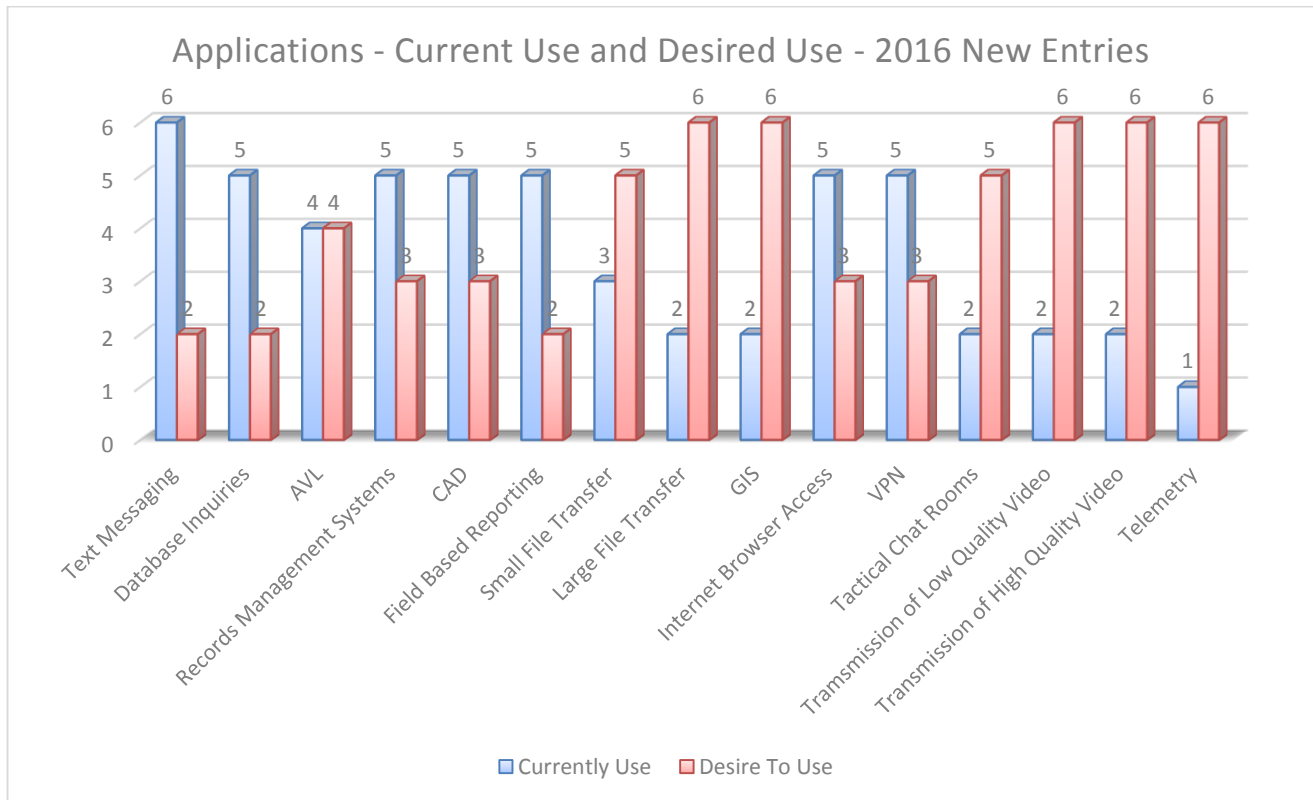
Database Inquiries - Total





The following charts summarize the results above, comparing each application's current usage to desired usage, and indicating the number of agencies either currently using the application, or having a desire to use the application in the future.



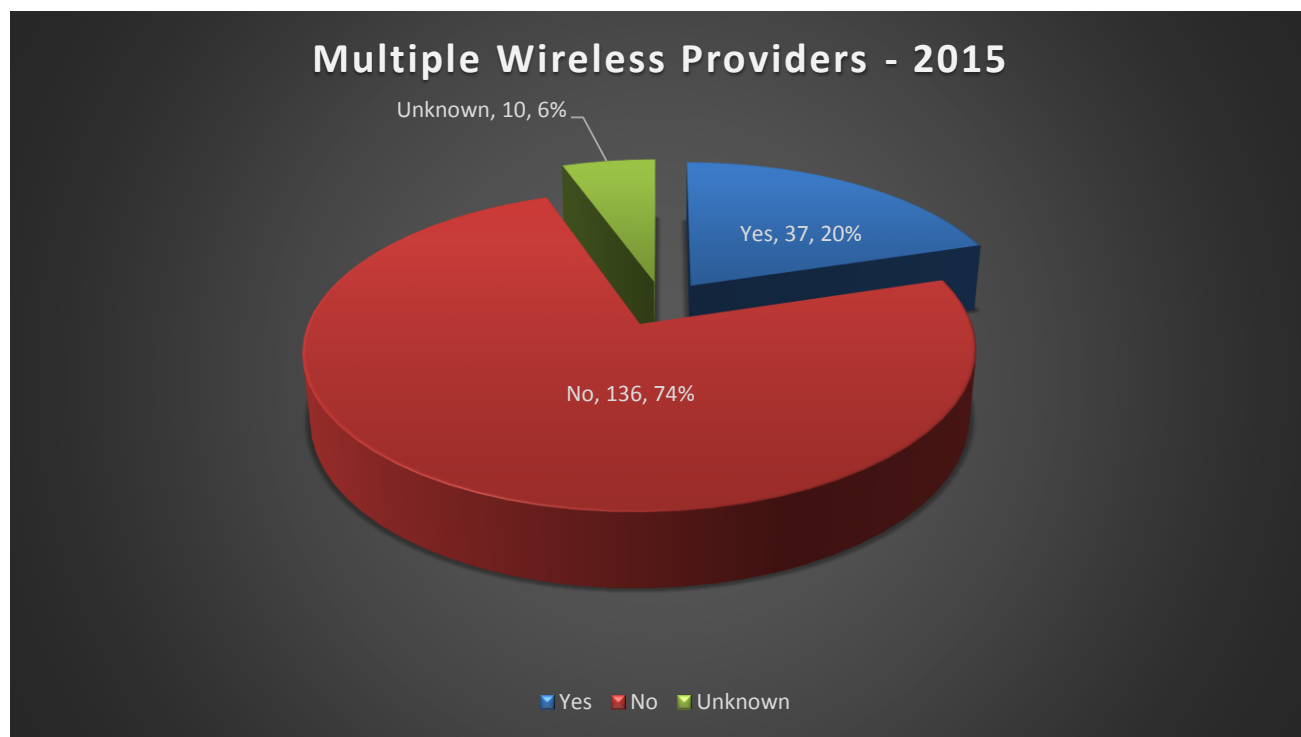




As can be seen, many agencies have a desire to utilize data services for applications specific to their discipline, but are currently unable to do so for a variety of reasons; however, the most prevalent barrier is cost, as can be seen in Section 3.6 below. Video and Telemetry were identified as the highest demanded applications that have the lowest current adoption rates.

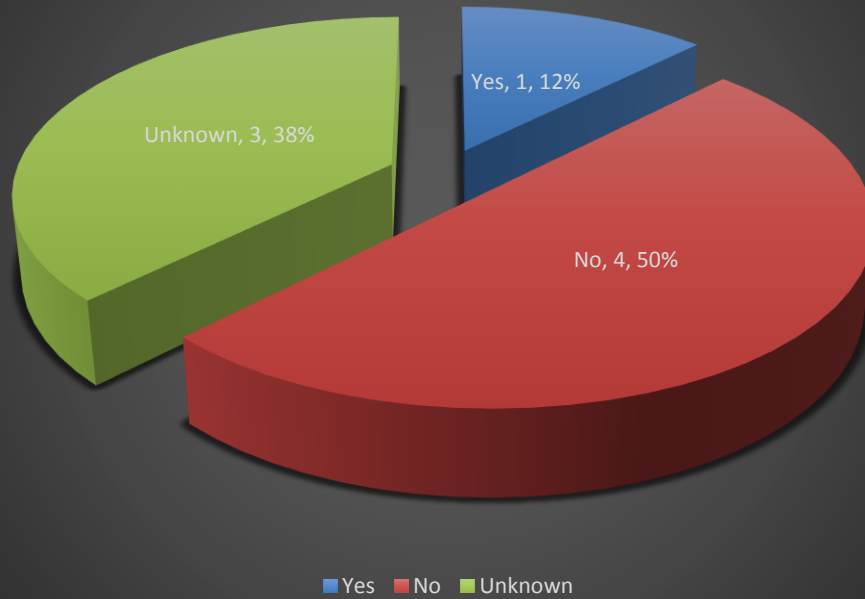
2.3.3. *Multiple Service Providers*

Agencies were asked to provide information as to whether or not they currently utilize multiple wireless providers. The charts below reflect the responses to those questions.

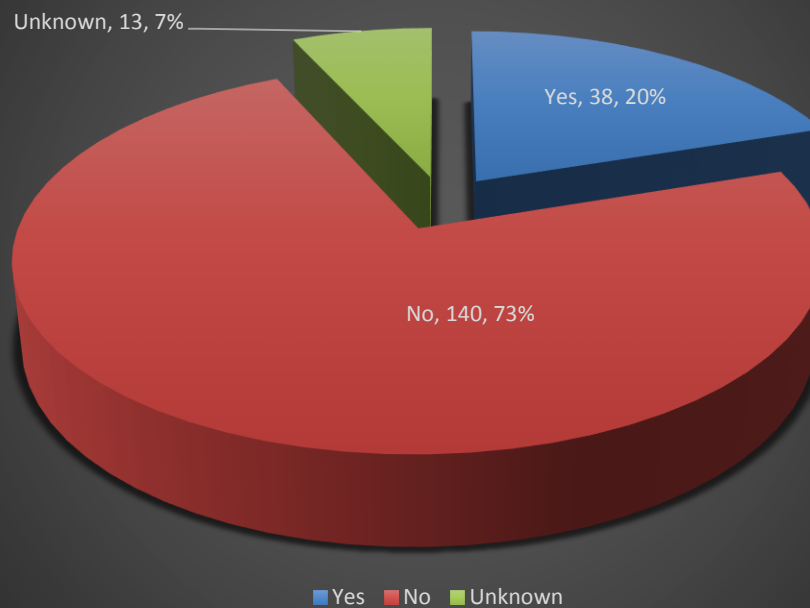




Multiple Wireless Providers - 2016 New Entries



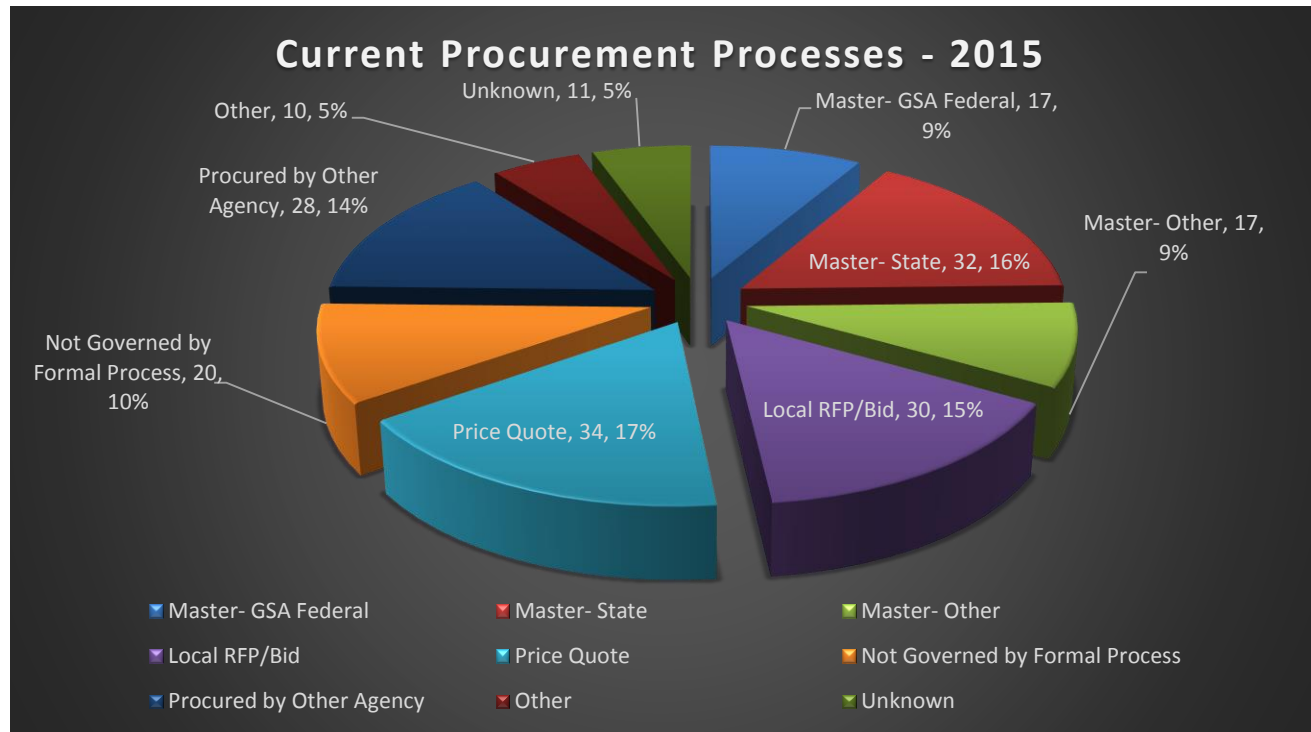
Multiple Wireless Providers - Total





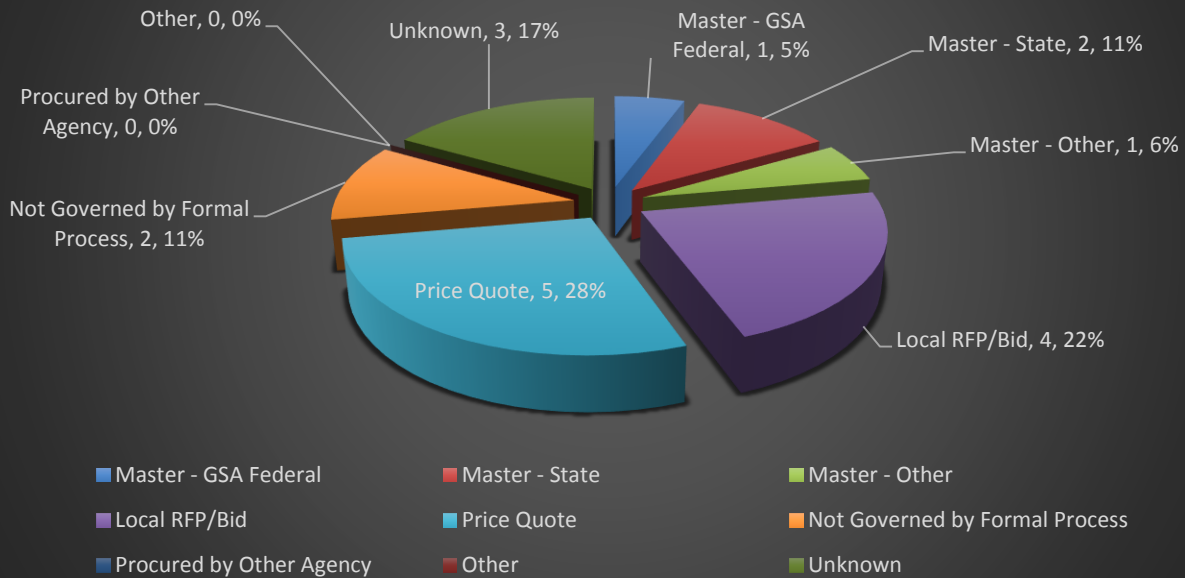
2.4. CURRENT PROCUREMENT

Agencies currently procure their services through a variety of methods. Approximately 32 percent of respondents indicated that they utilize some type of master contract, while 16 percent use a request for proposals (RFP)/bid process and 18 percent base their selections on price quotes.

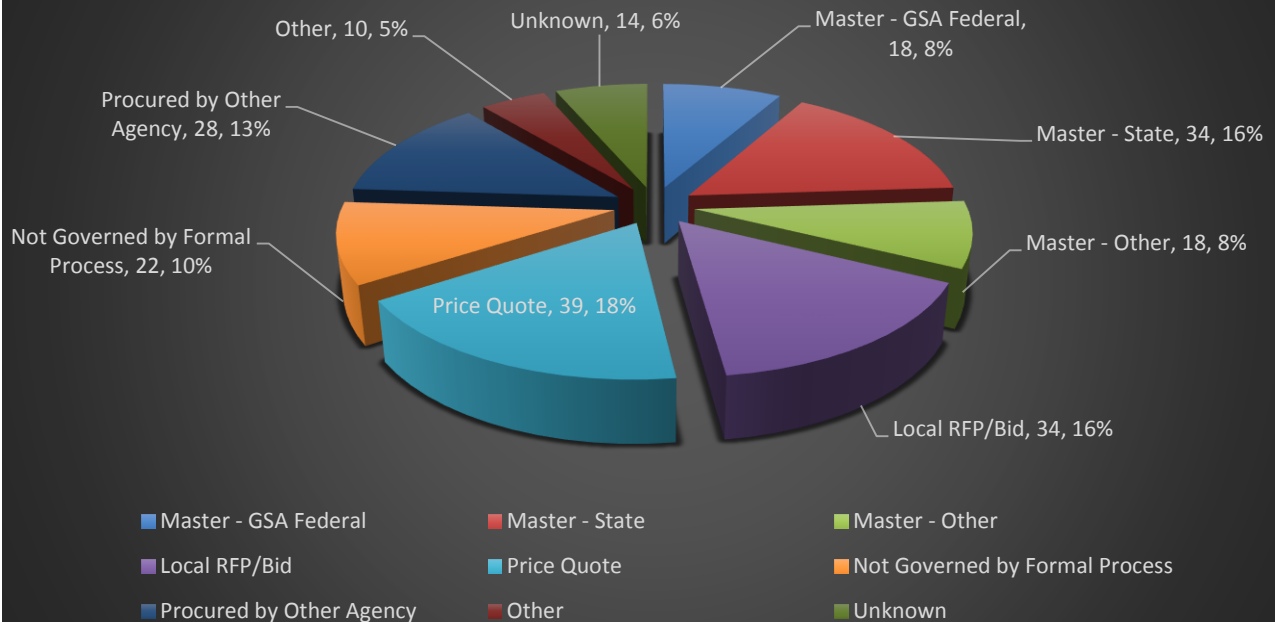




Current Procurement Processes - 2016 New Entries

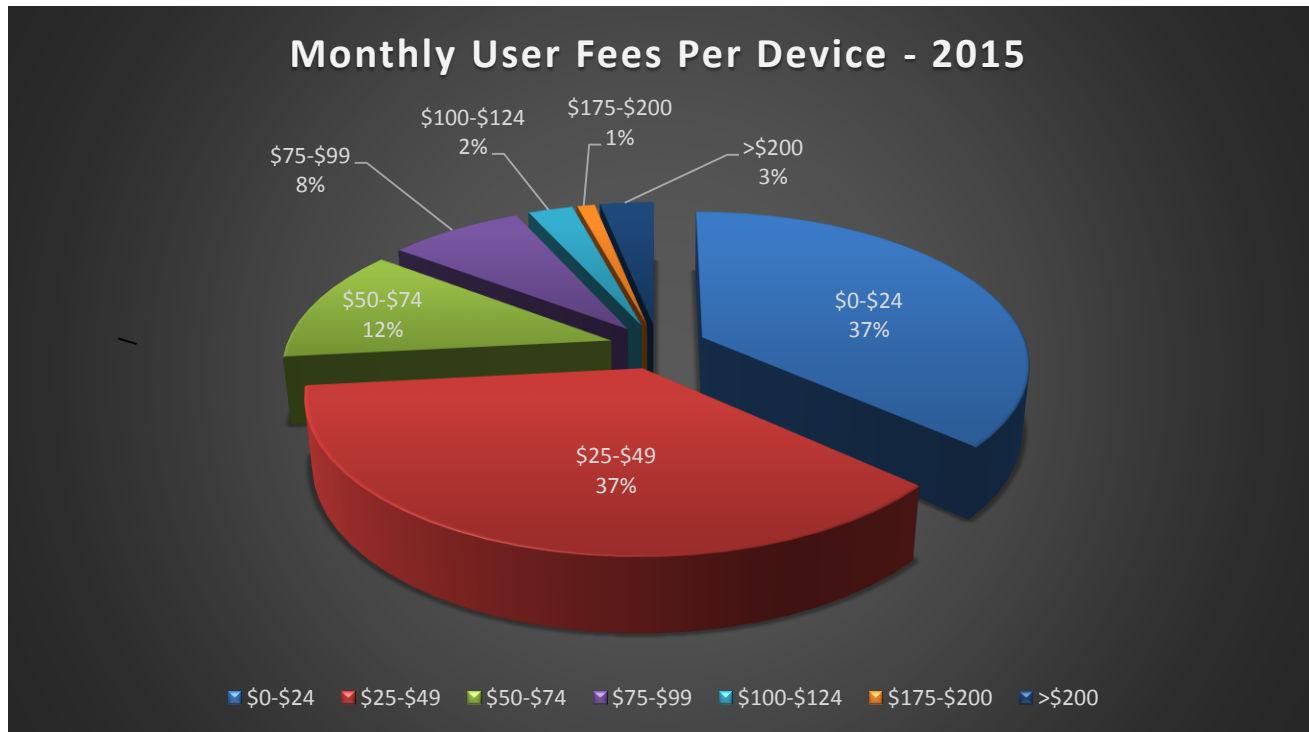


Current Procurement Processes - Total



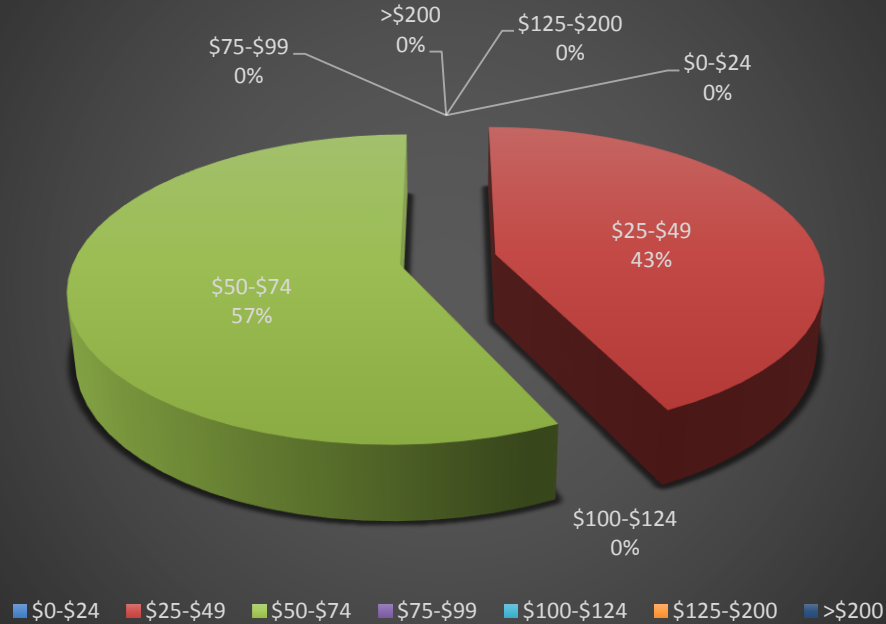


The average monthly cost per device was reported to be \$66.61, while the median cost per month was found to be \$45. Of these two figures, the median cost would be considered more indicative of current price offerings. Some agencies reported extremely high monthly costs, but others reported no monthly costs, which skewed the average calculation somewhat. The charts below reflect the distribution of agency monthly costs.

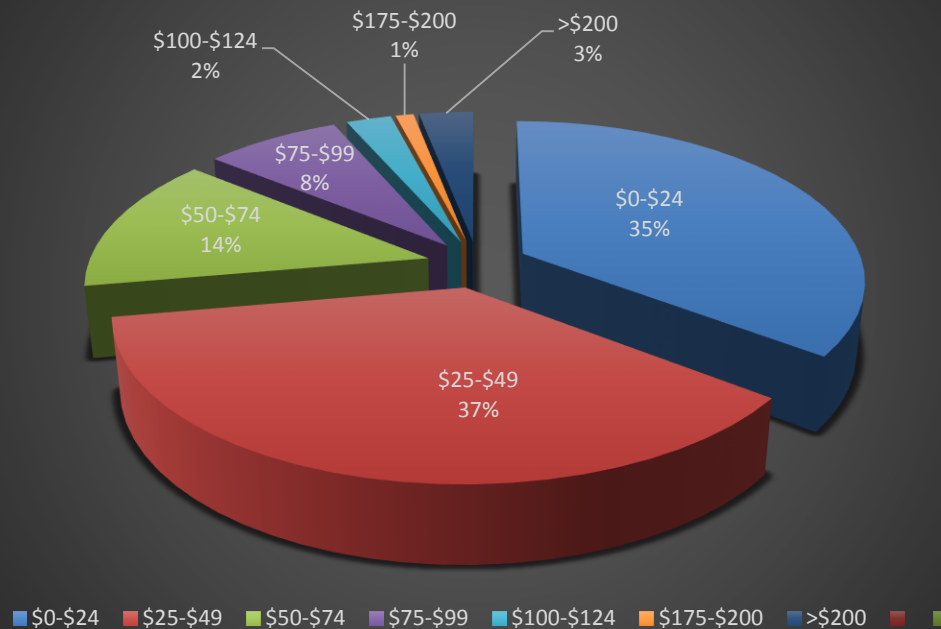




Monthly User Fees Per Device - 2016 New Entries

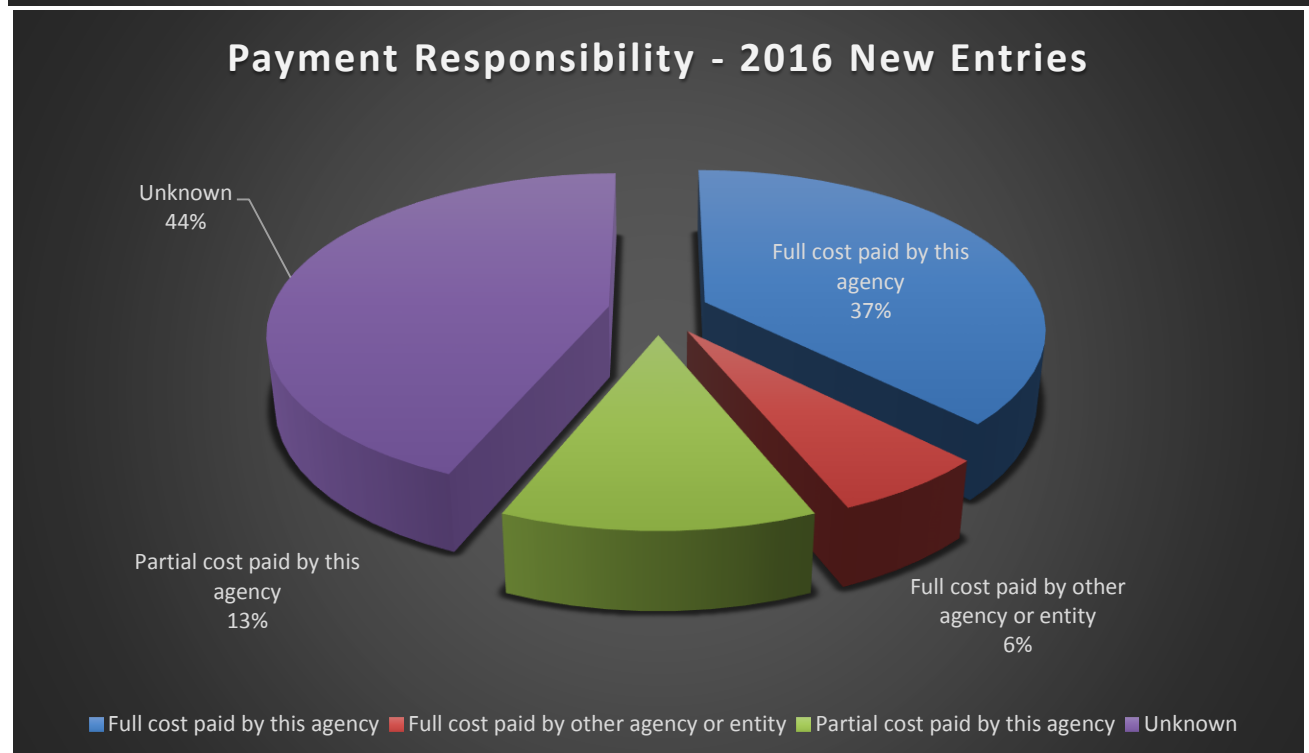
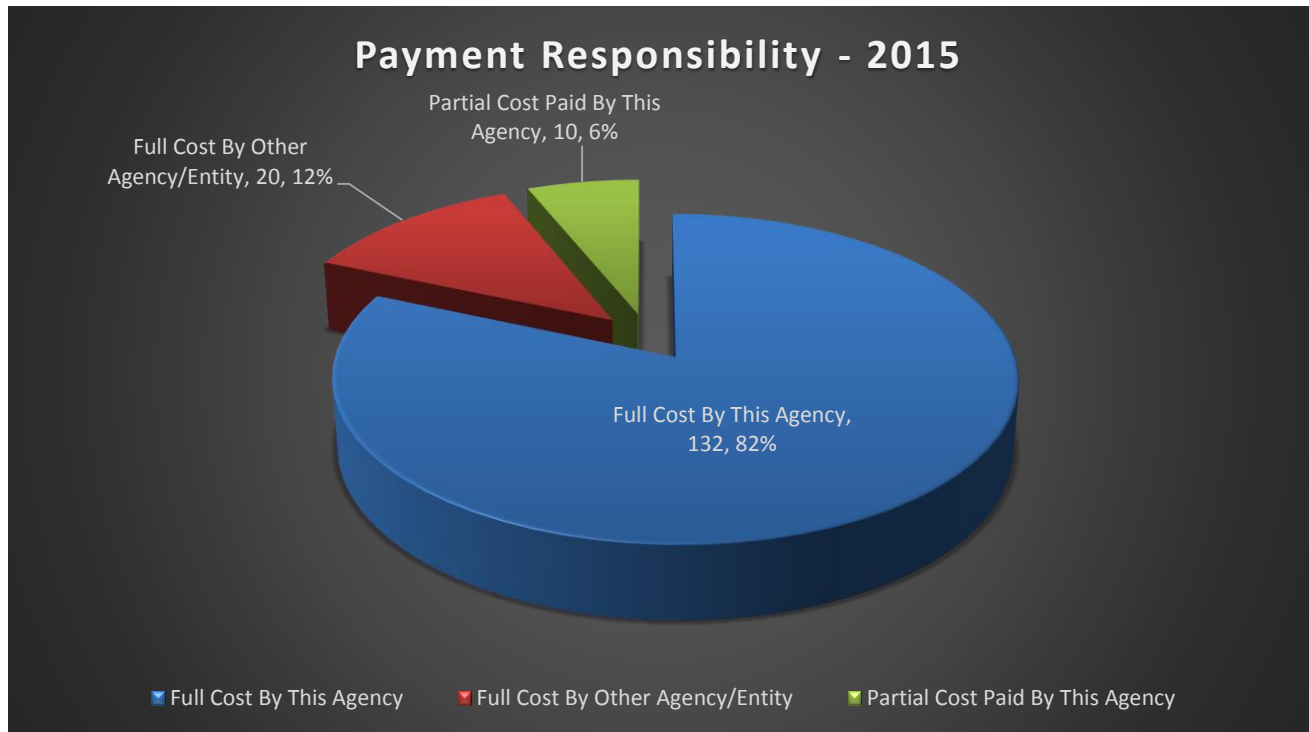


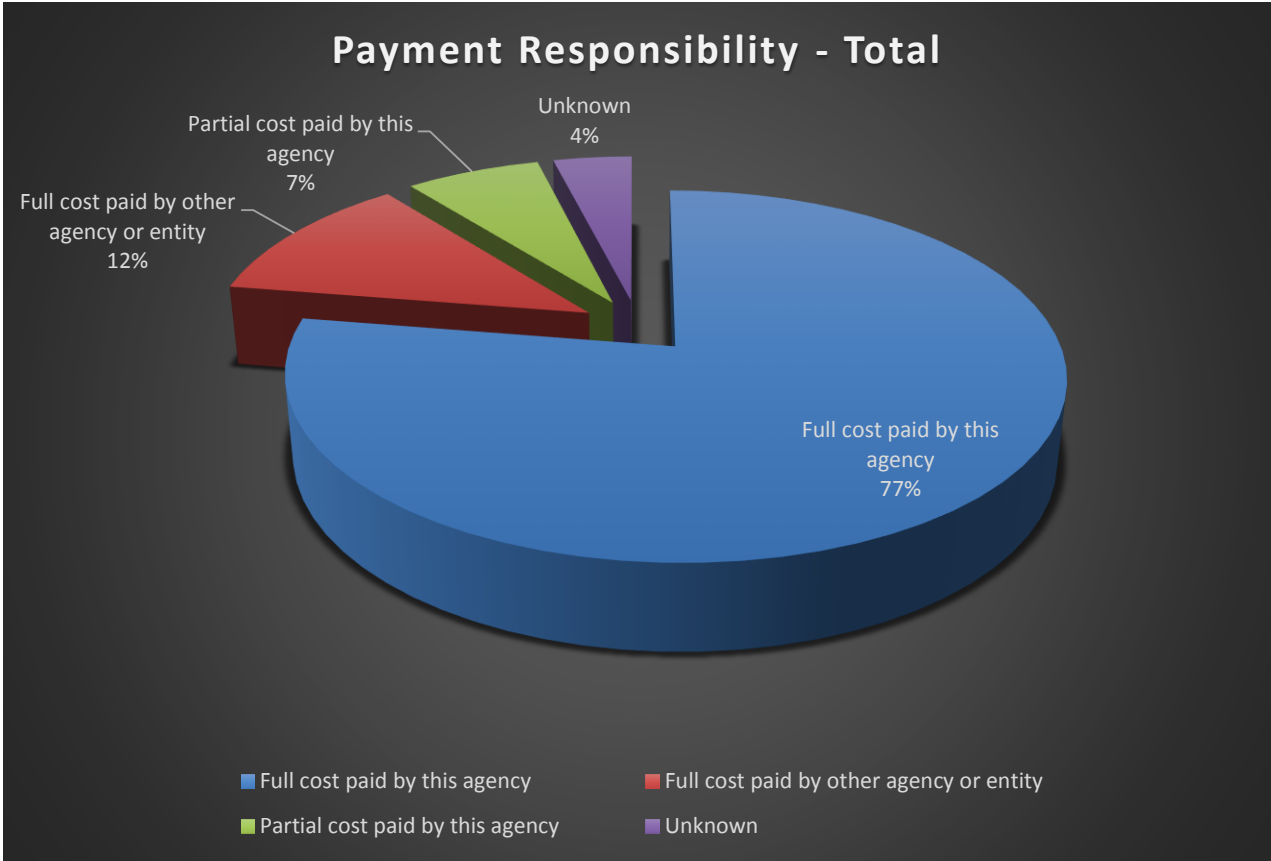
Monthly User Fees Per Device - Total





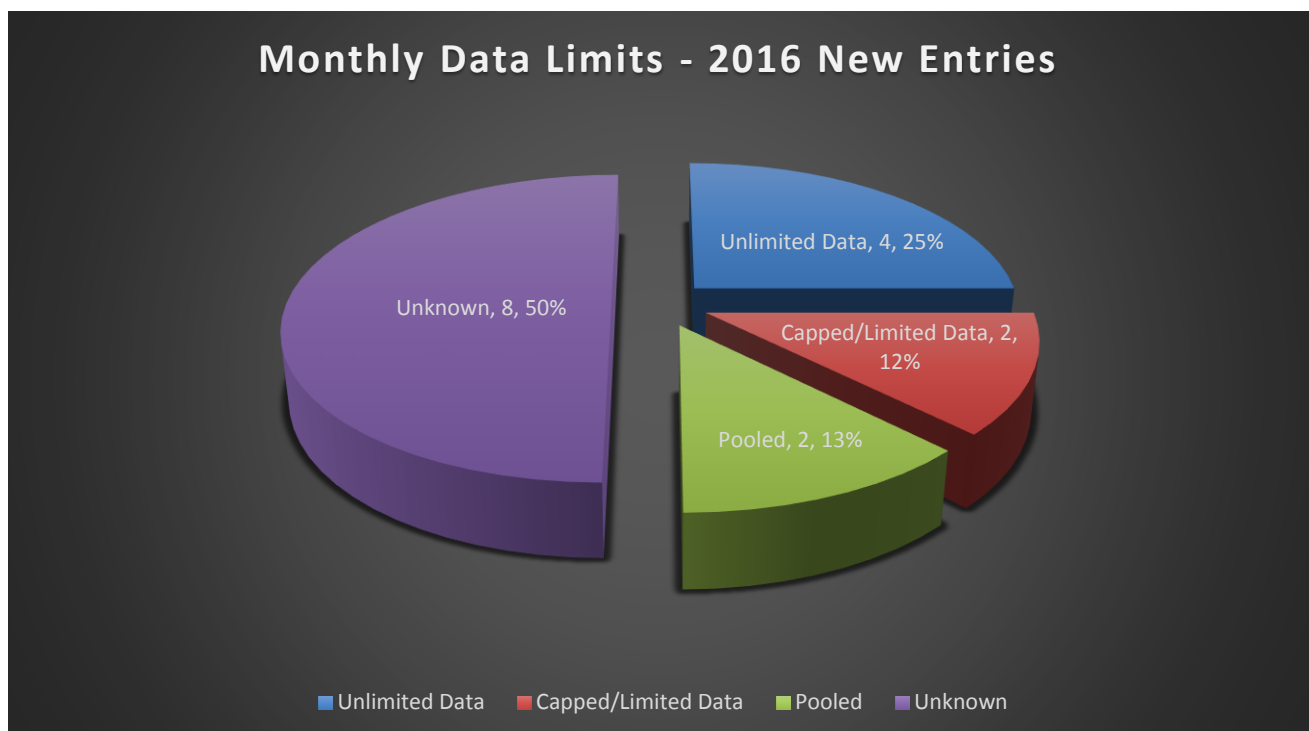
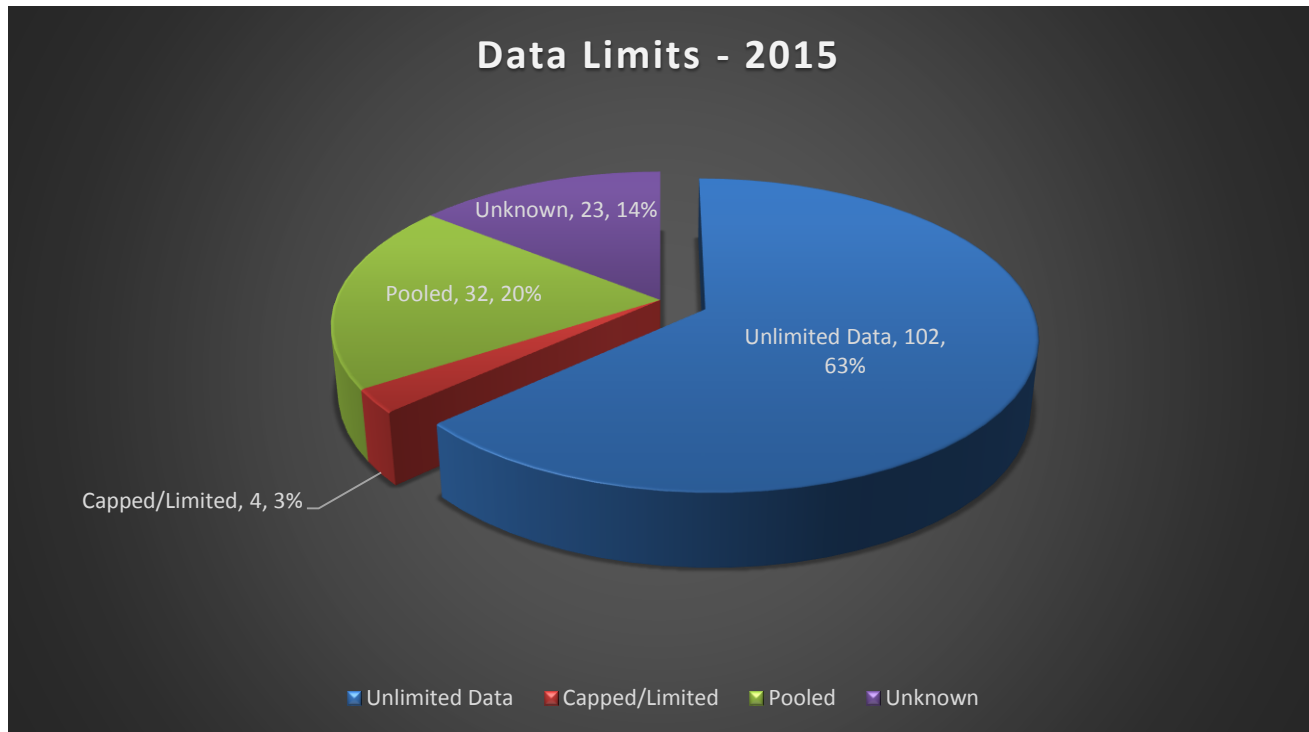
Information was requested and gathered concerning which entity is responsible for paying monthly fees for wireless service. The charts below display those responses.

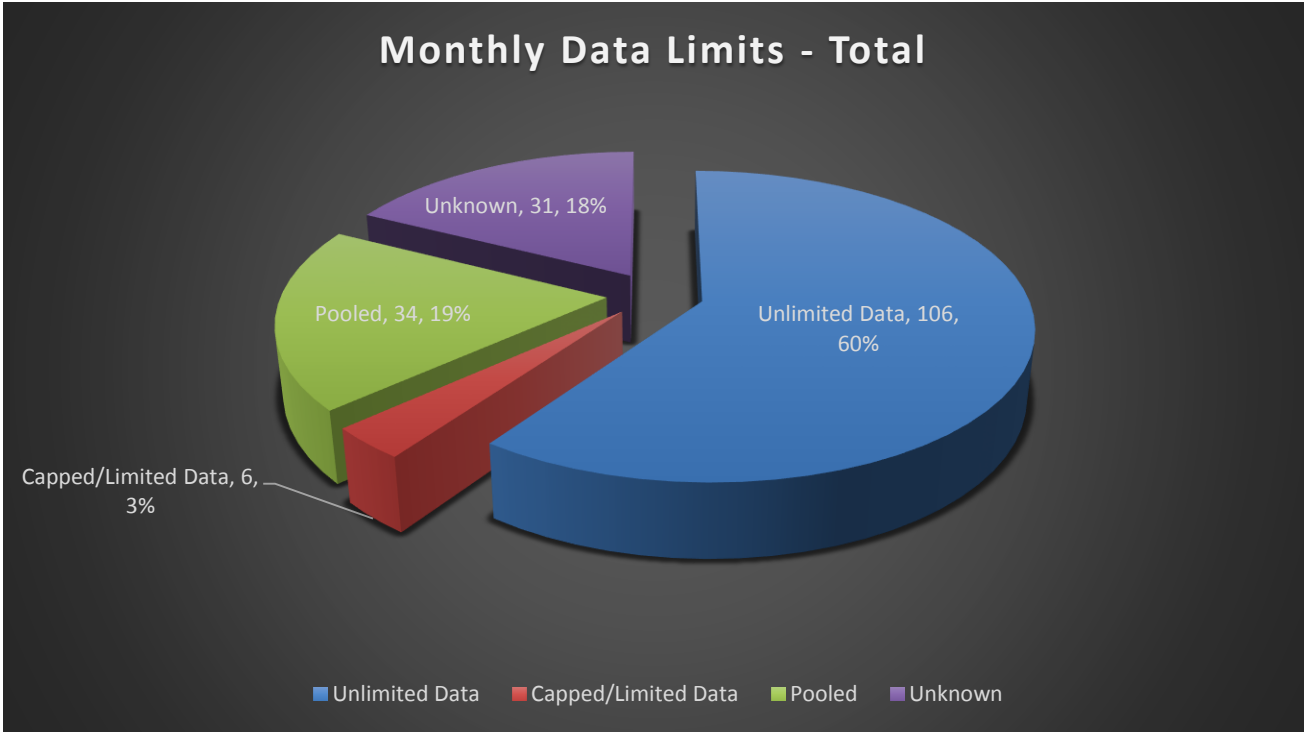






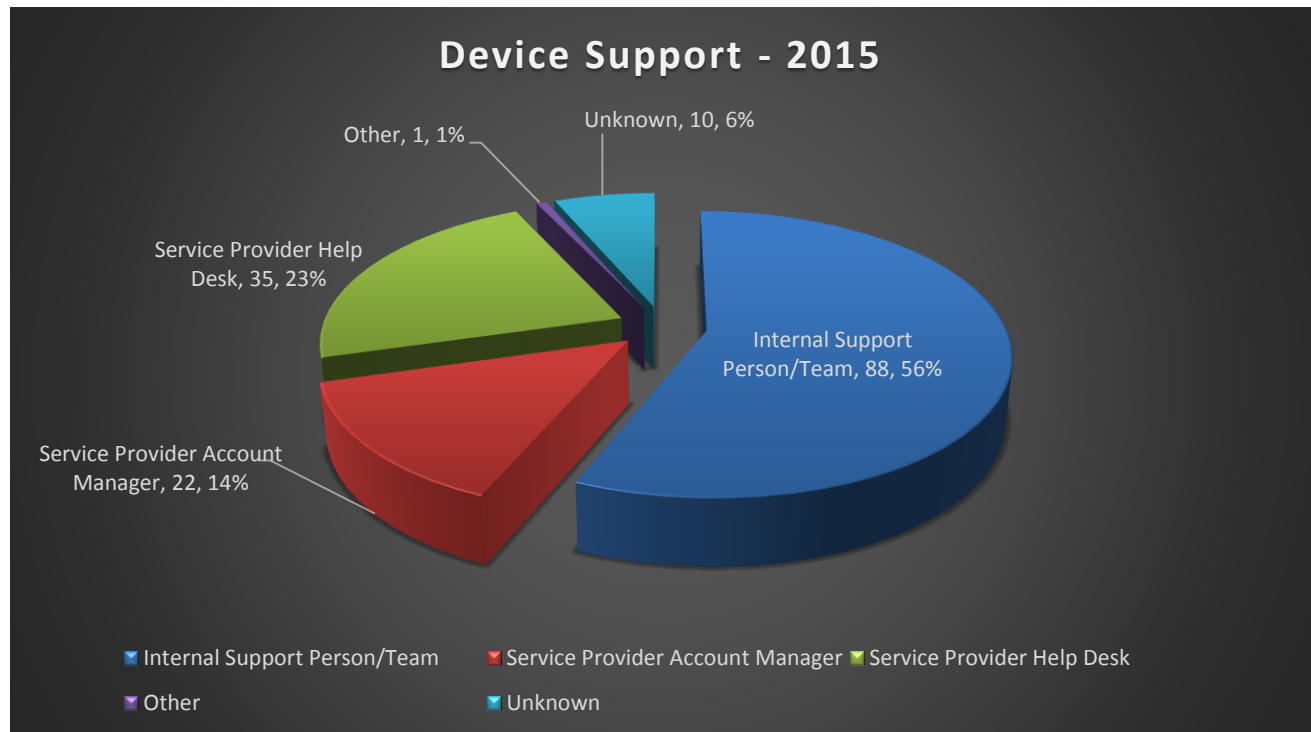
Respondents were asked to provide information concerning their current data plans and what, if any, limits they currently have. The charts below depict the responses.





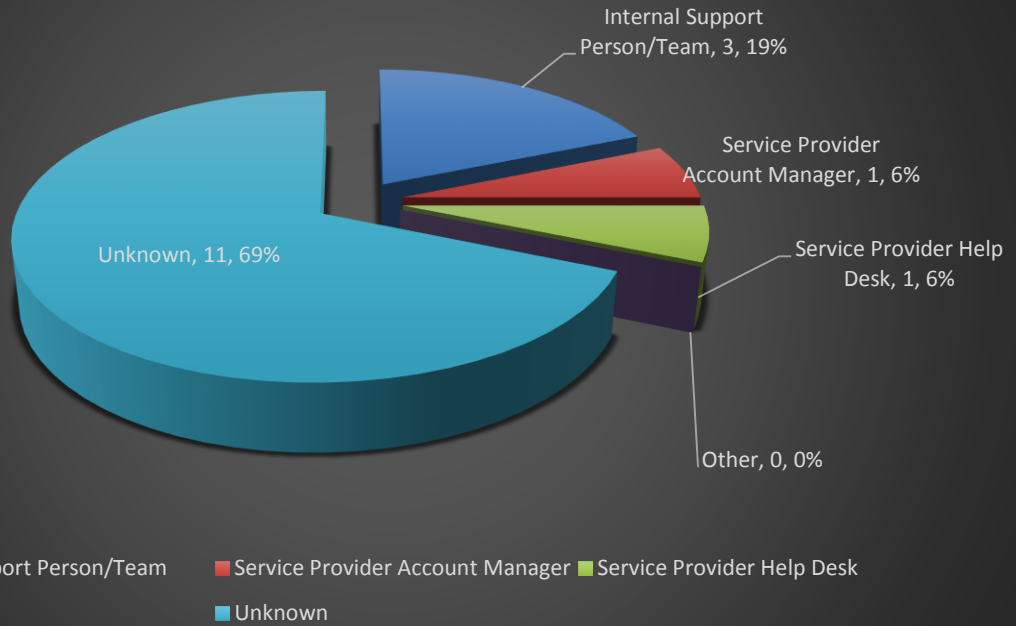


Respondents were asked to provide information concerning the level of support they receive from their wireless services provider. As can be seen in the charts below, the vast majority of agencies indicated their support comes from within their agency.

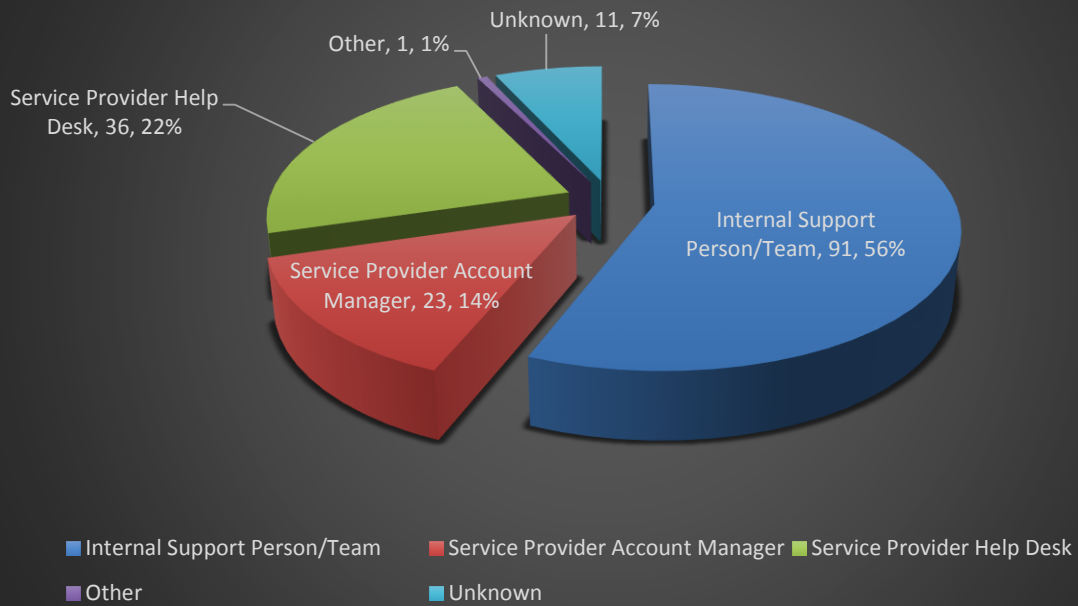




Device Support - 2016 New Entries



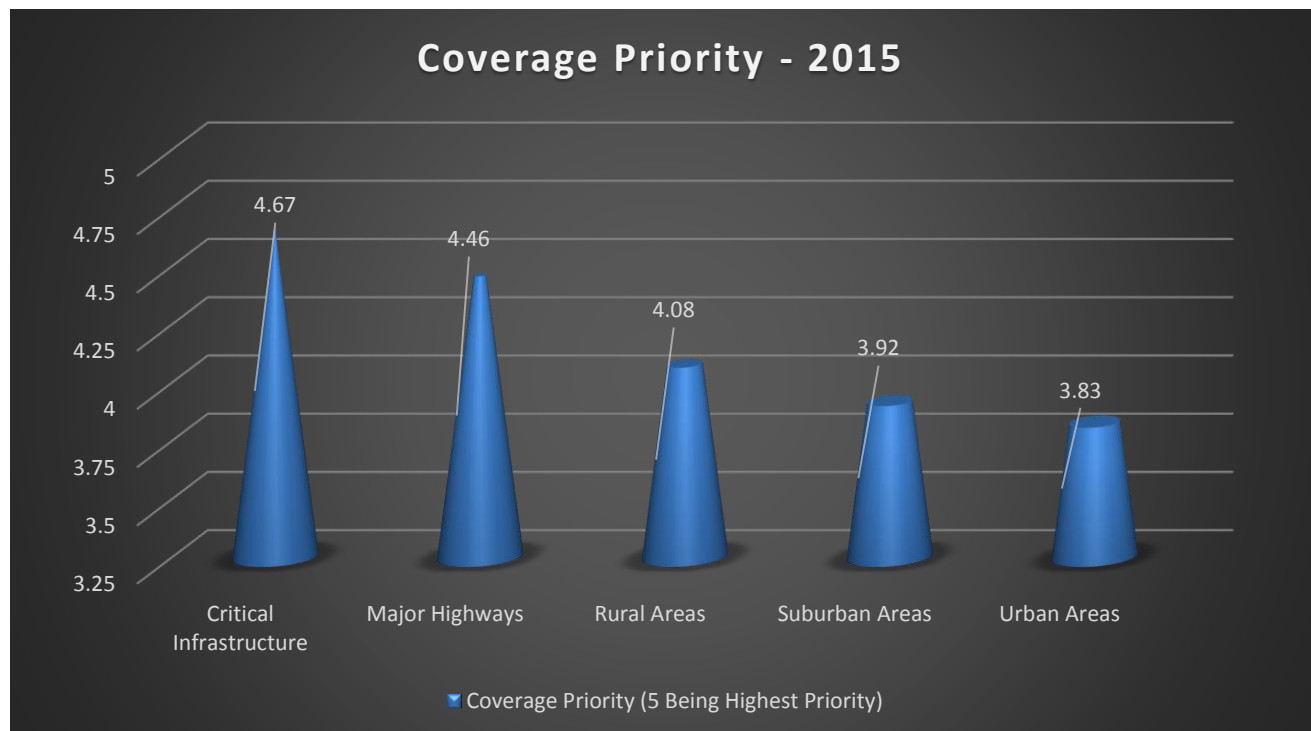
Device Support - Total





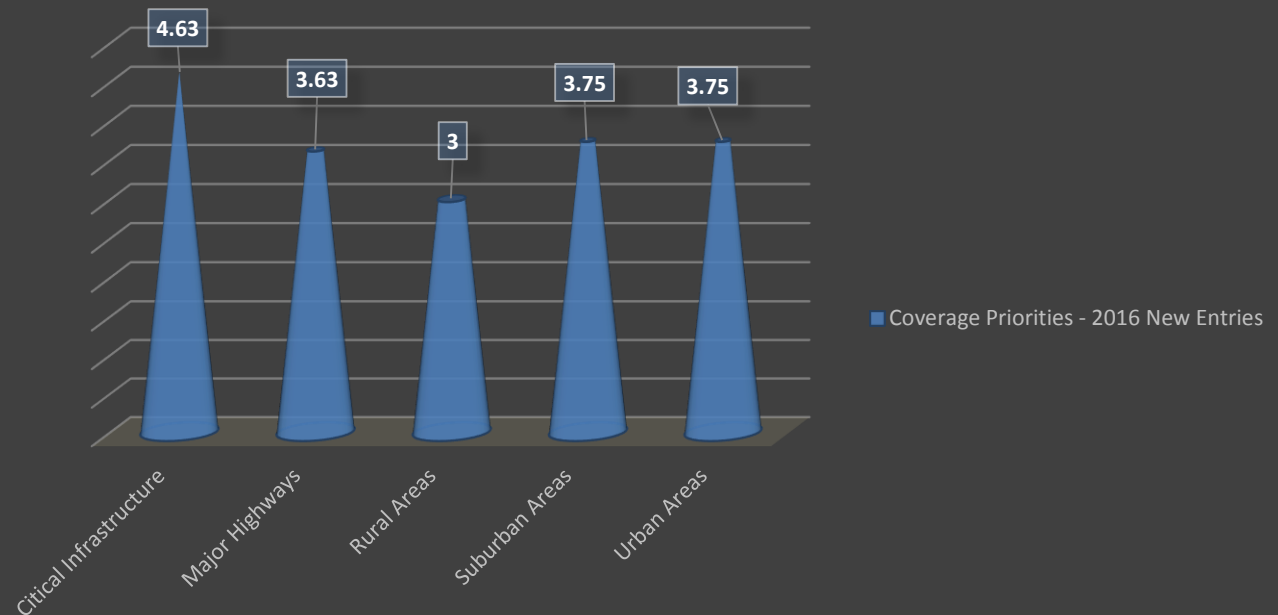
2.5. PHASED DEPLOYMENT

The supplemental survey that was sent to the public safety community contained questions that asked respondents to prioritize coverage locations for NPSBN construction. The locations they prioritized were Urban, Suburban, Rural, Critical Infrastructure, and Major Highways. Respondents were asked to rate each location on a scale of 1 to 5, with 5 being the highest priority for coverage. The charts below depict the responses by averaging the priorities placed on each location by each respondent. As can be seen, the order of coverage priorities based on the 2015 data for coverage was: Critical Infrastructure, Major Highways, Rural Areas, Suburban Areas, and Urban Areas. The 2016 data slightly changed the order to: Critical Infrastructure, Major Highways, Suburban Areas, Urban Areas, and Rural Areas. It should be noted that there were only 8 agencies which responded to the supplemental survey in 2016, and most were from urban or suburban areas.

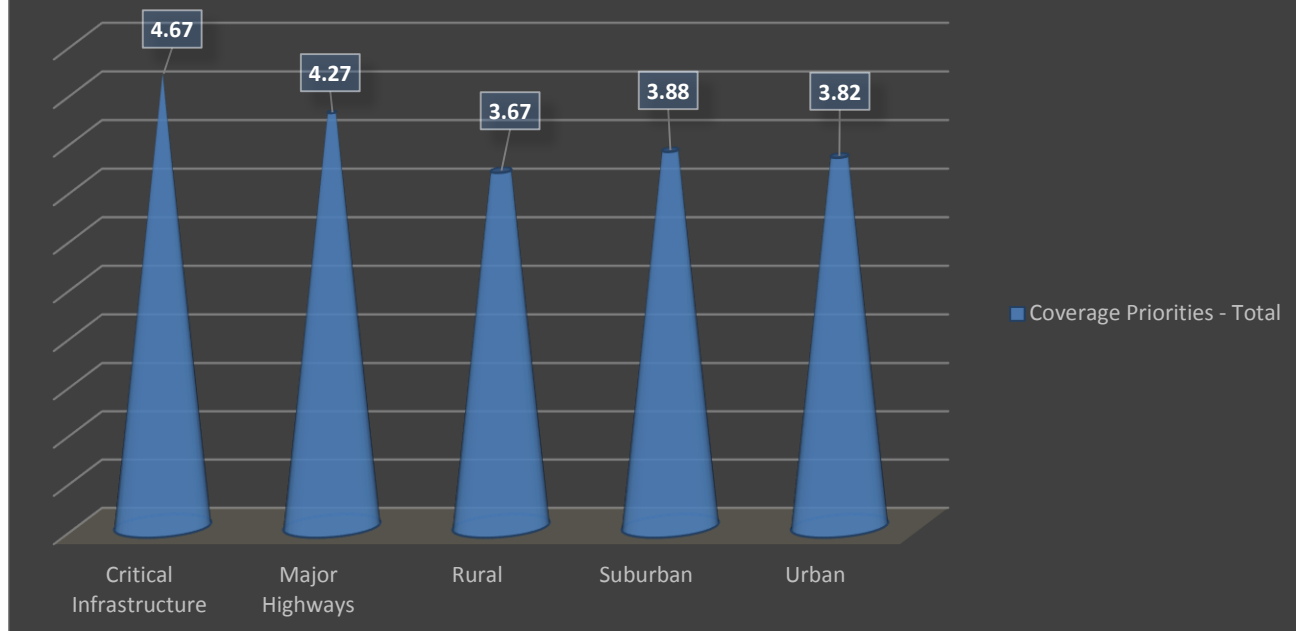




Coverage Priorities - 2016 New Entries



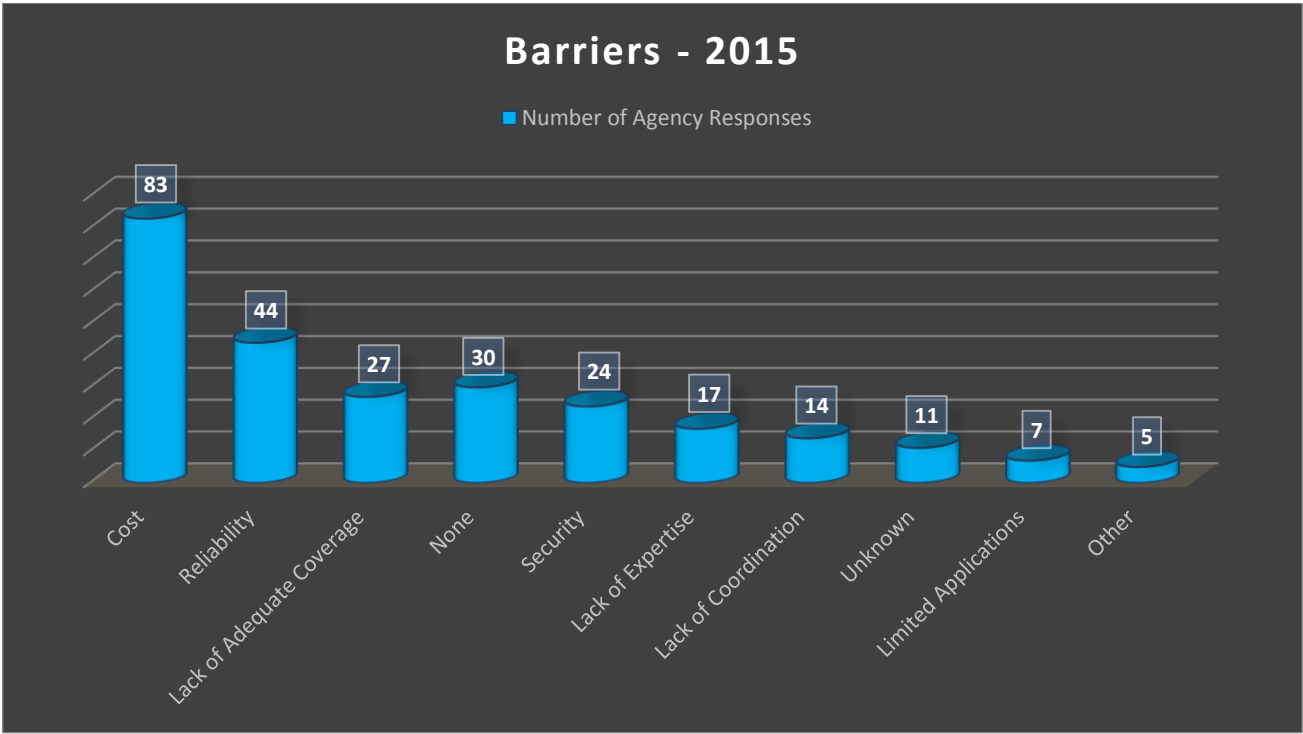
Coverage Priorities - Total

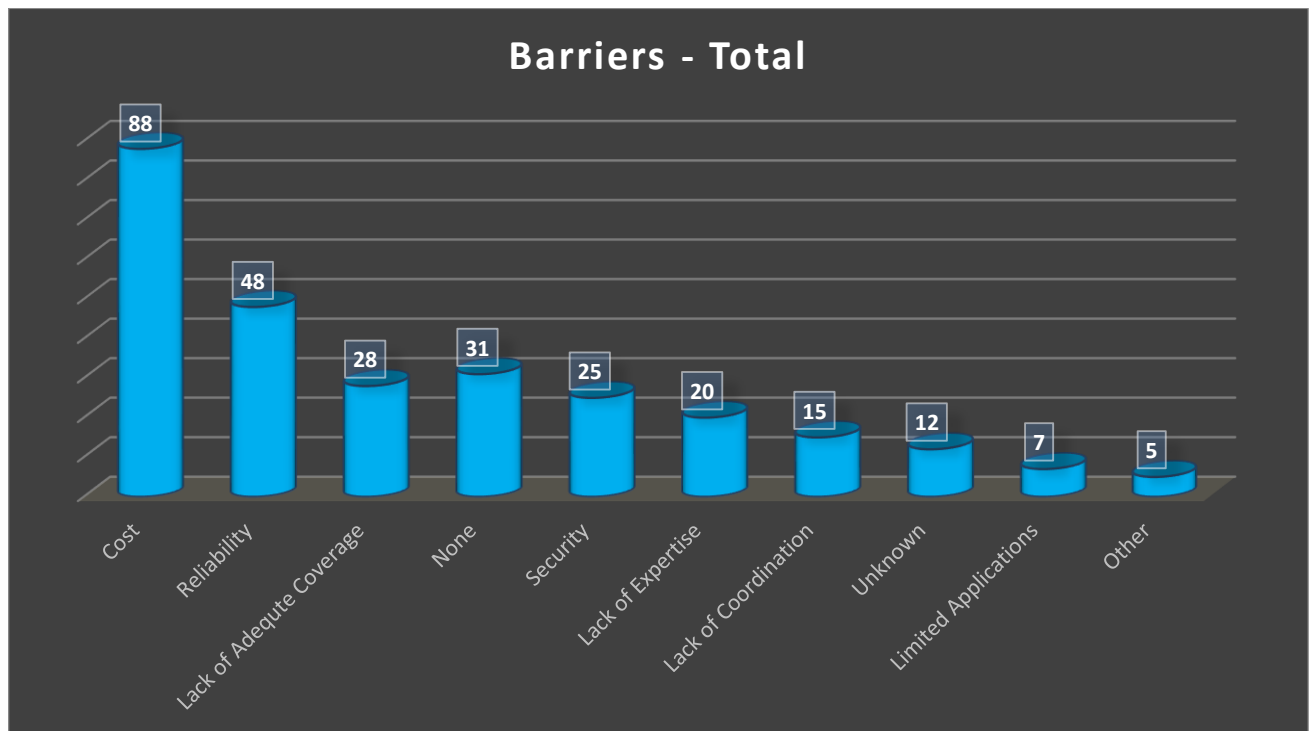
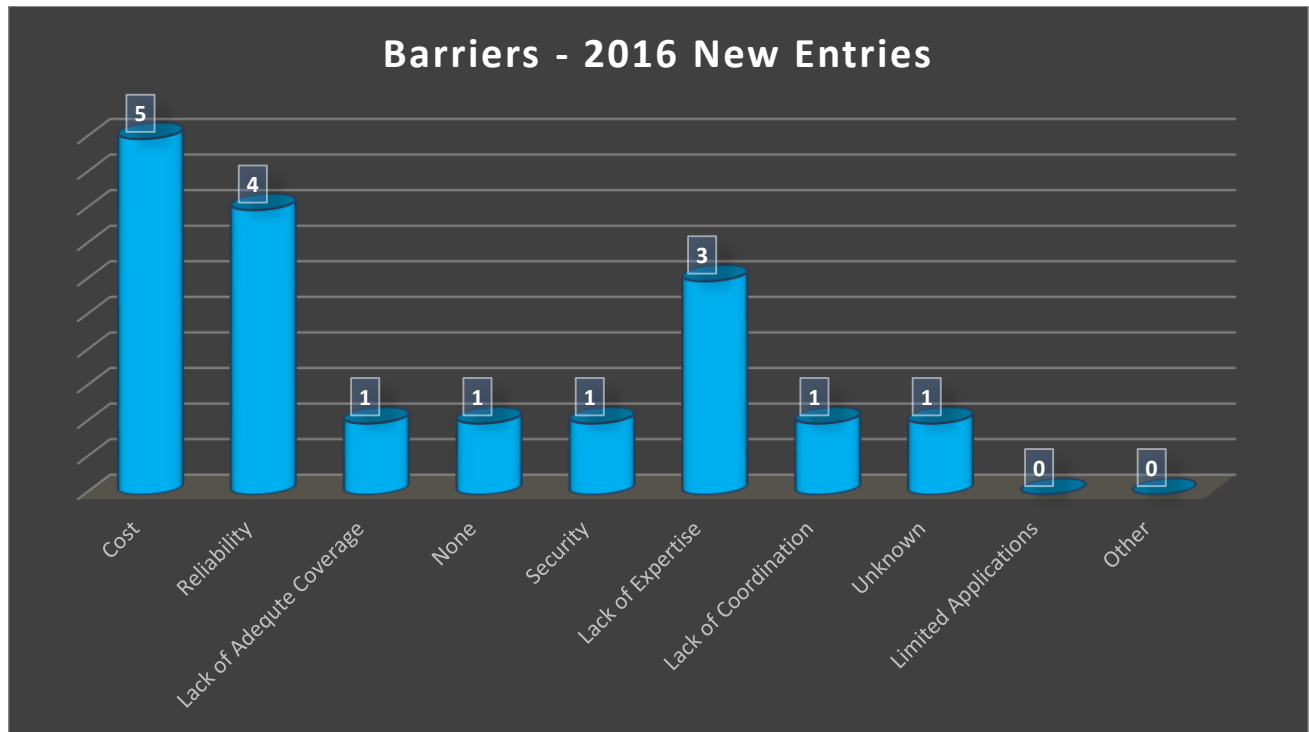




2.6. BARRIERS

Agencies were asked to identify the current barriers that exist today that would prevent them from utilizing wireless technology to its fullest extent. Agencies were permitted to identify multiple barriers. The charts below depict the responses to the online surveys. As can be seen, cost is seen as the most significant barrier to agencies for utilizing wireless technology.





In addition to the online surveys, the State conducted 8 regional workshops around the state where county and local public safety officials were invited to be educated about the NPSBN, and then asked to provide feedback on requirements. They were asked to identify significant issues concerning wireless broadband



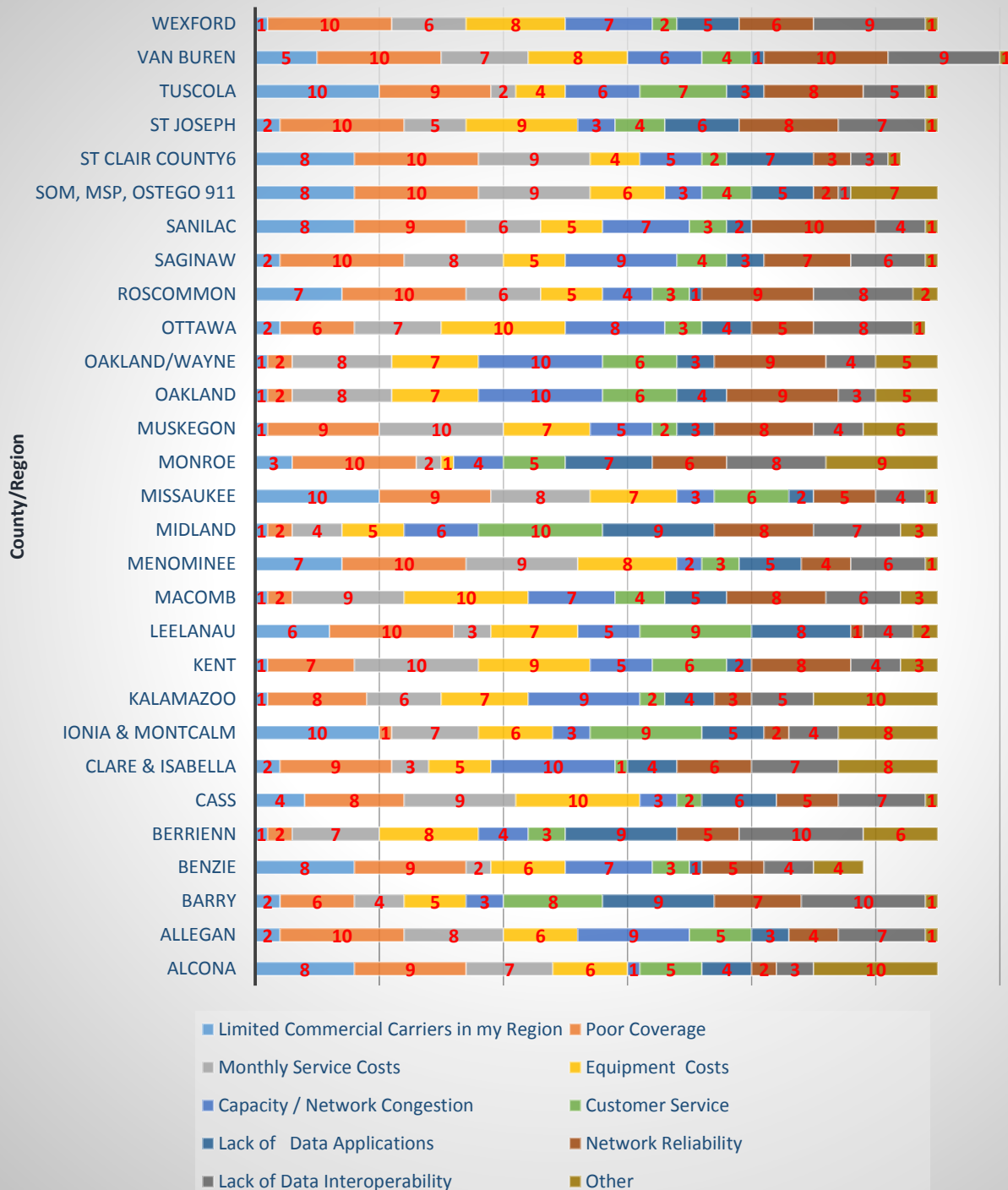
MICHIGAN DEPARTMENT OF TECHNOLOGY, MANAGEMENT AND BUDGET

adoption, and why such adoption may be inhibited in the current environment. Respondents were asked to rank the issues on a scale of 1 to 10, with 1 being least significant in inhibiting adoption and 10 being most significant. The chart below depicts the results of the feedback:

:

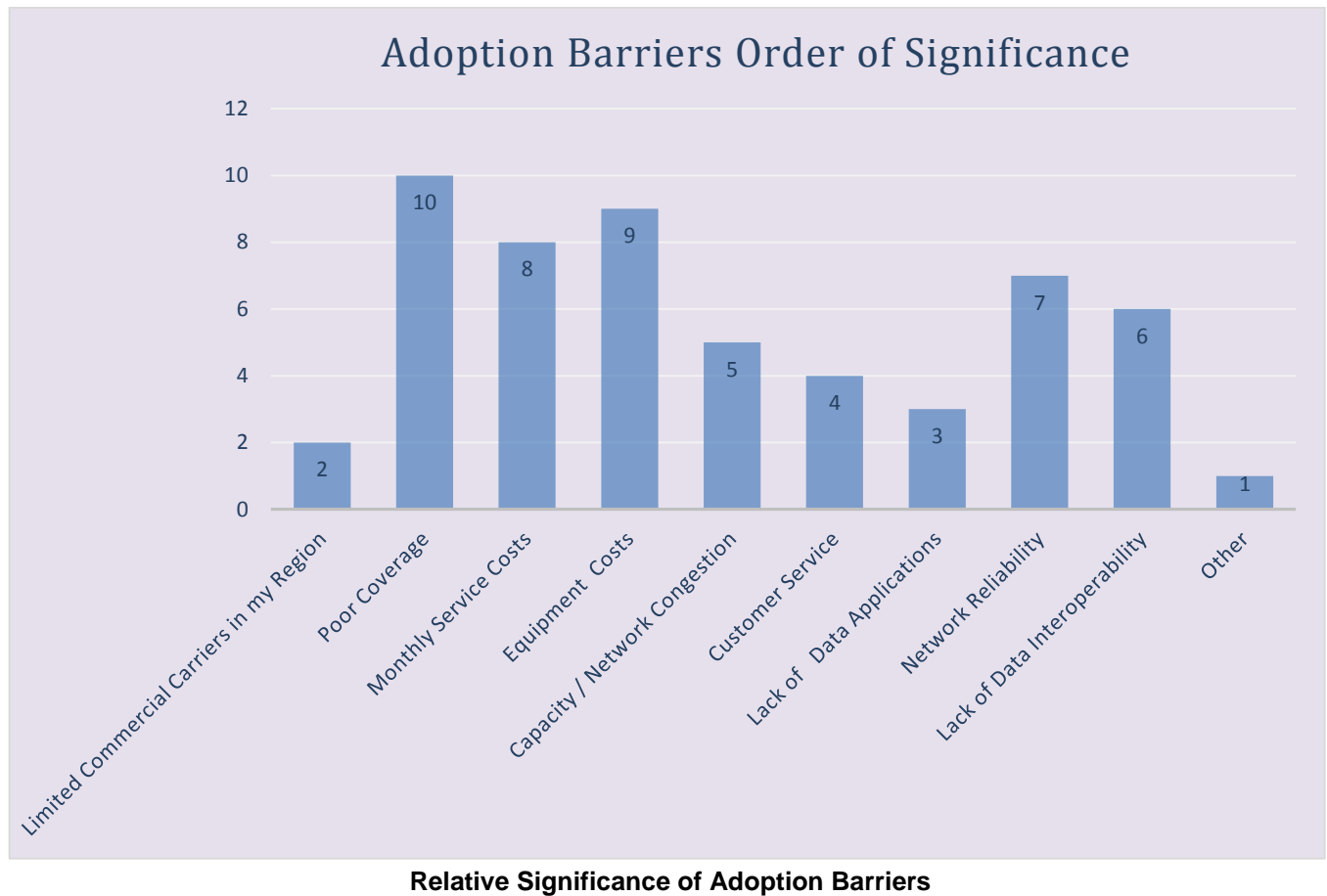


Adoption Issues





The chart below reflects the relative significance of the adoption barriers based on the feedback at the regional workshops. “Poor Coverage” ranked as the most significant barrier, and “Other” as the least significant.





3. RECOMMENDATIONS

The State has collected a substantial amount of data pertaining to the level FirstNet must be built to meet user requirements and promote adoption. Based on the data collected, the State has developed recommendations for FirstNet regarding how it feels FirstNet should interpret this data. The following sections detail the State's recommendations for each of the primary data collection categories:

3.1. COVERAGE OBJECTIVES

During the 2015 data collection period, the State received very few responses from local agencies concerning local coverage requirements. A very concerted effort was undertaken in 2016 to reach out across the state to as many local agencies as possible. This was largely accomplished through the 8 regional meetings previously referenced.

The direct outreach and regional meeting approach proved to be a great success. The local coverage requirements were captured and placed on maps in Appendix I. Michigan submits these local requirements in the hope they will be taken into consideration during the development of the state deployment plan, along with data submitted in 2015.

Please refer to section 2.1.2 above for coverage requirements developed from the State planning efforts. The State requests FirstNet to take these requirements into consideration as the Michigan deployment plan is developed.

Michigan looks forward to meaningful engagement with FirstNet and its selected partner in developing an appropriate deployment plan for the State in 2017.

3.2. USERS AND OPERATIONAL AREAS

The State collected extensive data on users and operational areas tied primarily to the MDST questions asked in the two surveys conducted, as well as feedback gleaned from the regional workshops. The survey responses represented an estimated 29 percent of all first responders within the state, and included a representative distribution between public safety disciplines, as well as between urban and rural departments. Based upon the percentages of broadband devices issued to first responders, it is estimated that there are approximately 31,337 broadband devices issued today. It is expected that this number will grow once the capabilities provided by FirstNet are available.

In addition to agency-issued devices, there are a very large number of personal devices that are used for work-related functions for which users will desire FirstNet access. When considering these devices, it reasonably can be assumed that there will be a demand for a minimum of 51,023 devices to account for a minimum of one device for each primary responder, plus an additional 15,613 devices for mounting in vehicles.



3.3. CAPACITY OBJECTIVES

Michigan has several urban areas where capacity planning will be necessary. Detroit, Flint, Ann Arbor, Midland, Lansing, Grand Rapids, Kalamazoo/Portage, Traverse City, and Pontiac are all significant urban areas within the state. Additionally, Detroit, Ann Arbor, and Lansing all have large professional or college sports venues which draw significant crowds during the events. Appropriate capacity planning will have to take this into account.

The State had difficulty gathering data related to current data usage amongst agencies. Even if that data had been collected, it is not believed it would be very meaningful for determining data usage on the NPSBN. This is due to the fact that there are currently very few applications that public safety can run on commercial networks that are specific to public safety. It was very telling, however, that agencies responding to the surveys indicated that the most-desired data applications are the ability to transmit video and telemetrics. These bandwidth-intensive applications currently are not utilized very often due to bandwidth limitations of commercial networks. Once the NPSBN is deployed, it is anticipated that public safety data consumption will increase exponentially.

3.4. CURRENT PROCUREMENT

The State found that the agencies that completed the surveys had no prevalent method for contracting commercial broadband service. This emphasizes the need for FirstNet to offer various procurement options for user agencies. Most agencies reported paying between \$40 and \$50 per month, per device for commercial broadband service. It is the State's opinion that FirstNet must offer its service at monthly rates equivalent to or less expensive than that offered by commercial providers, in order to foster adoption.

3.5. PHASED DEPLOYMENT

The State, in coordination with its Statewide Interoperability Governance Board (SIGB), has provided its proposed phased build-out plan in the 2015 data submission. The plan is based upon the identified priorities within the state's public safety community to provide broadband service to current unserved and underserved areas of the state, and to emphasize areas near its coastline and international border. Maps were provided in 2015 to depict the state's phased build-out approach. The 2016 data collection effort did not alter the State's desired phased implementation plan.

3.6. BARRIERS

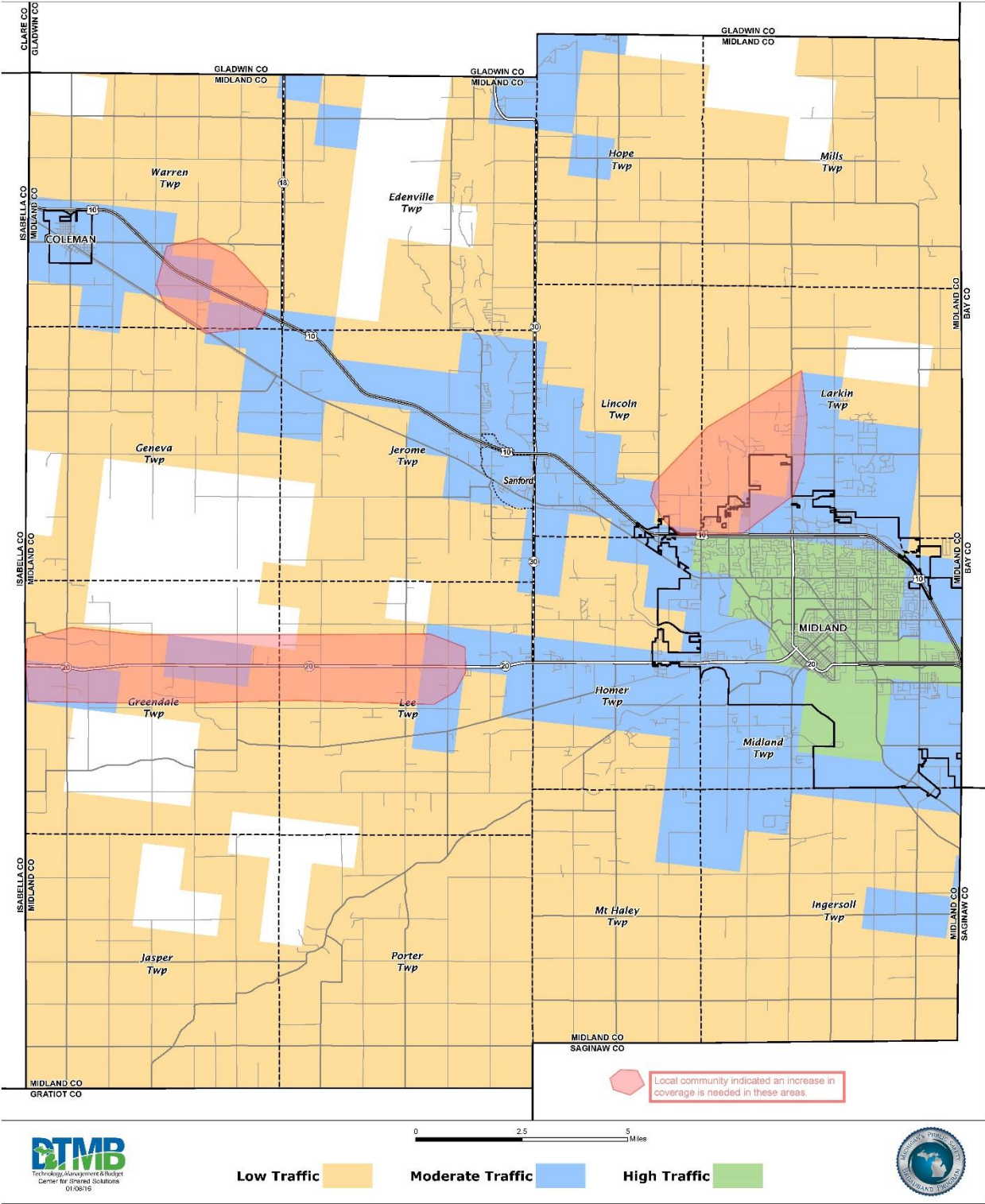
The State collected information via surveys relating to adoption barriers. Cost was identified as the greatest barrier, with 88 agencies indicating so, and the State believes that this will be true for the vast majority of agencies. The most significant inference concerning barriers is that FirstNet must offer its service at a cost that is highly competitive with current commercial offerings, otherwise adoption of the NPSBN may be severely inhibited.



4. APPENDIX I – LOCALLY IDENTIFIED COVERAGE AREAS

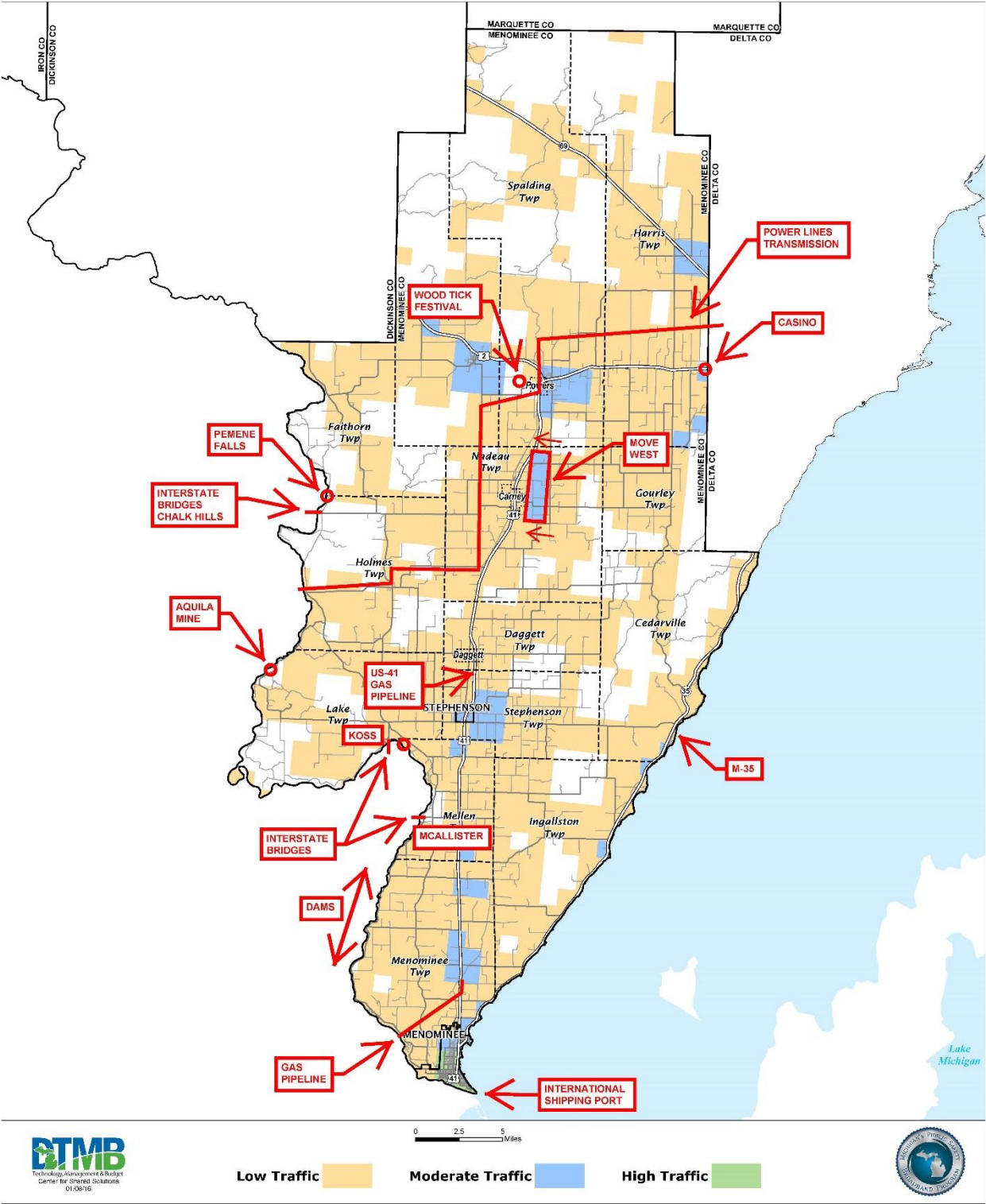


**FirstNet Coverage
Midland County**



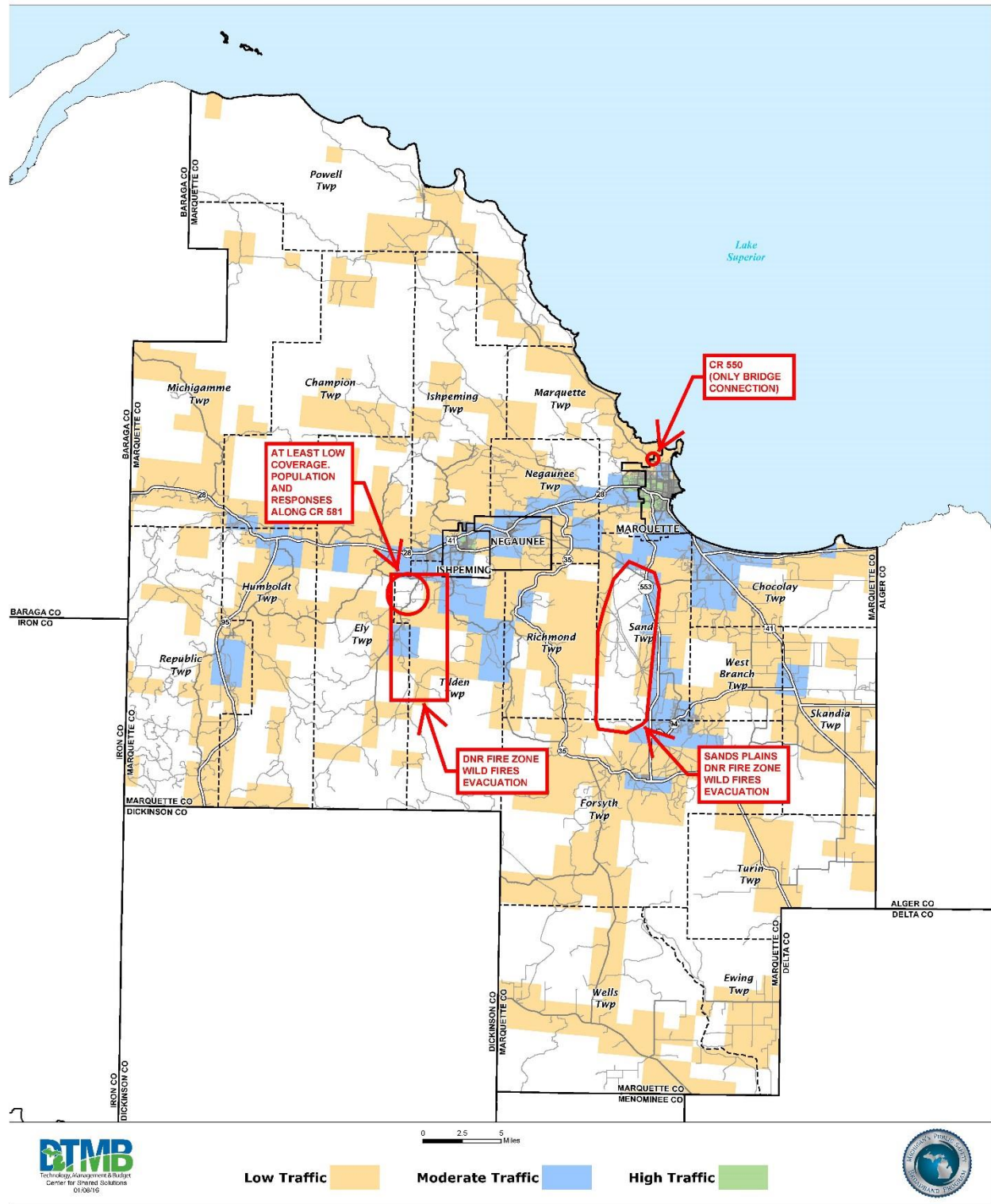


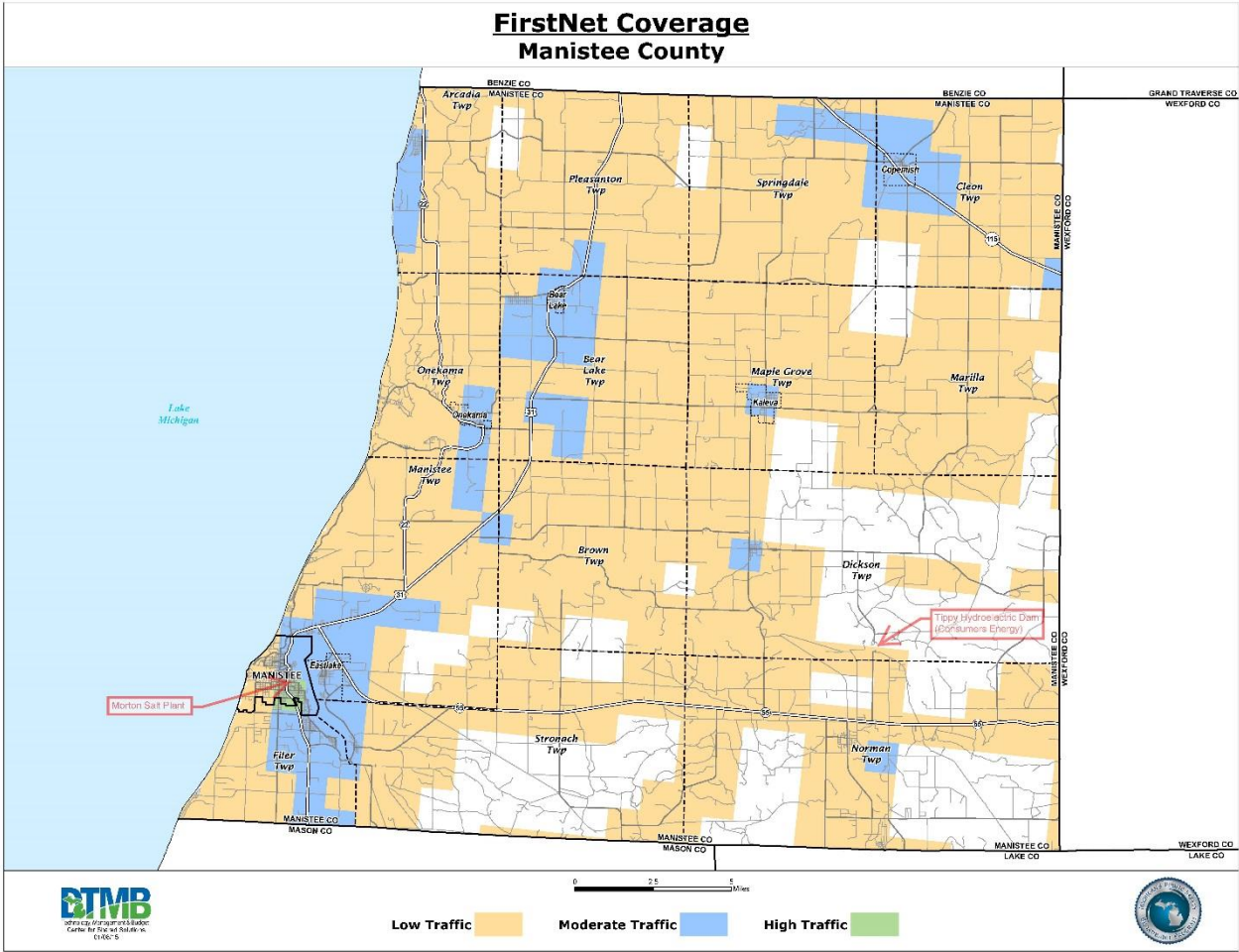
FirstNet Coverage
Menominee County





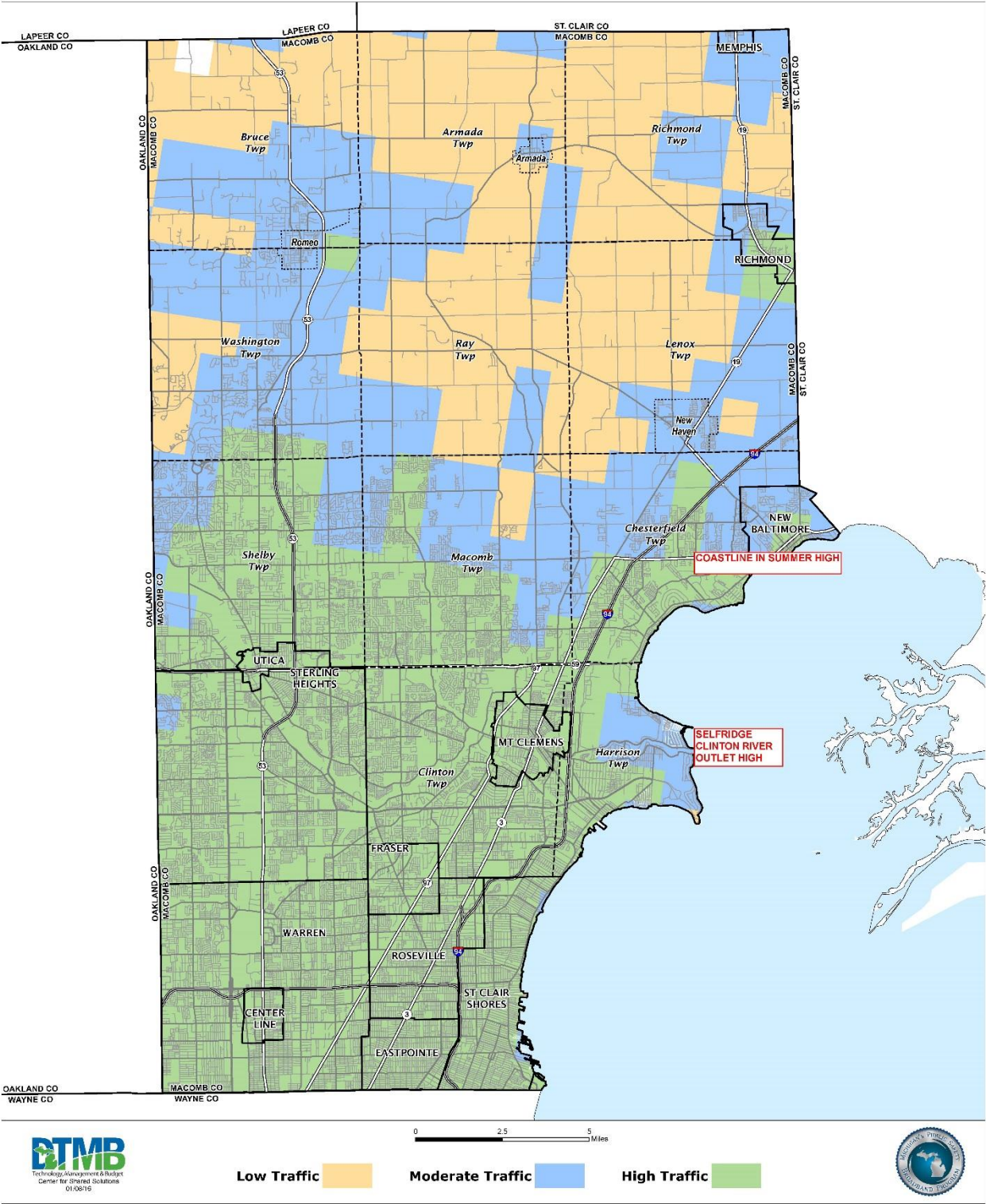
FirstNet Coverage
Marquette County

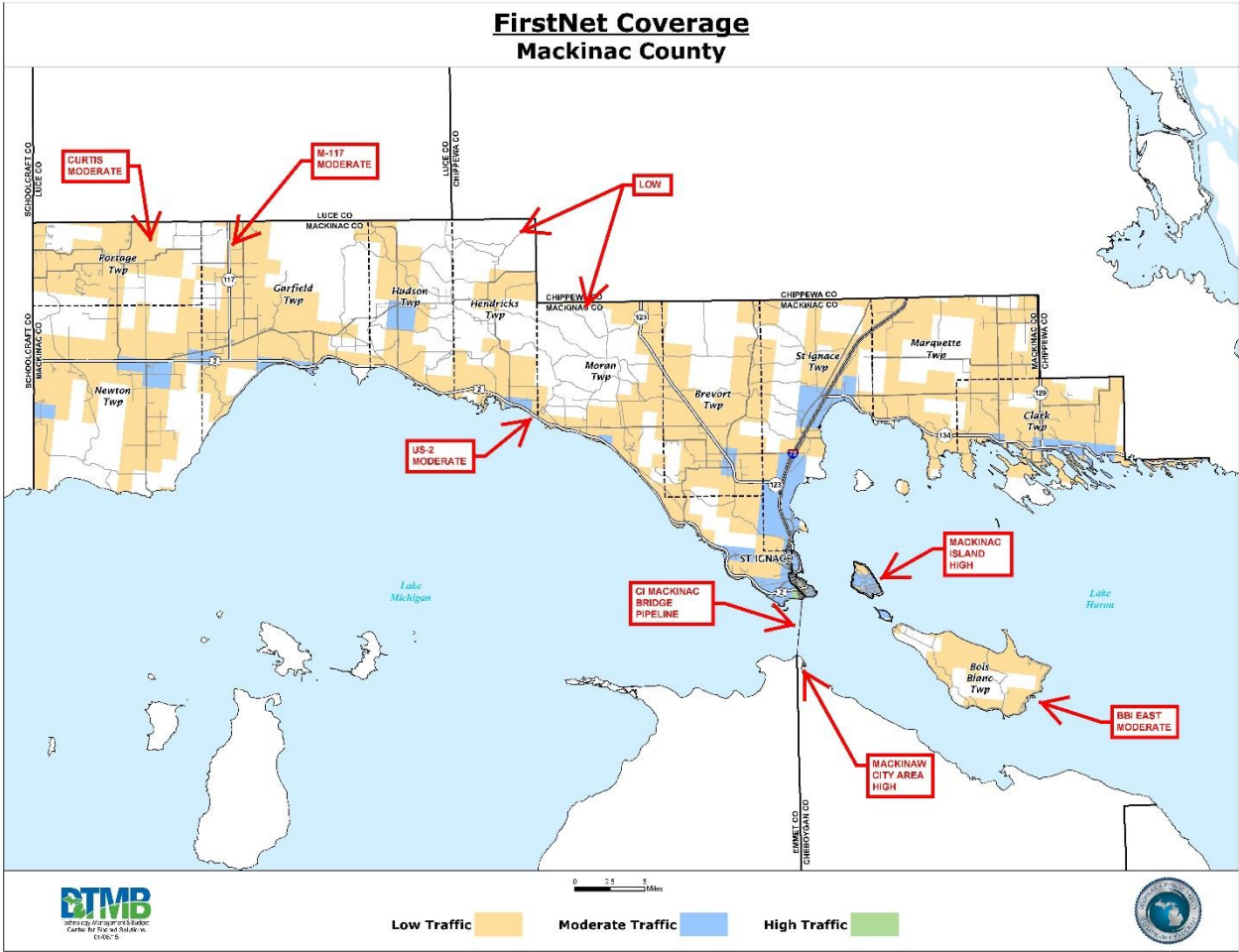


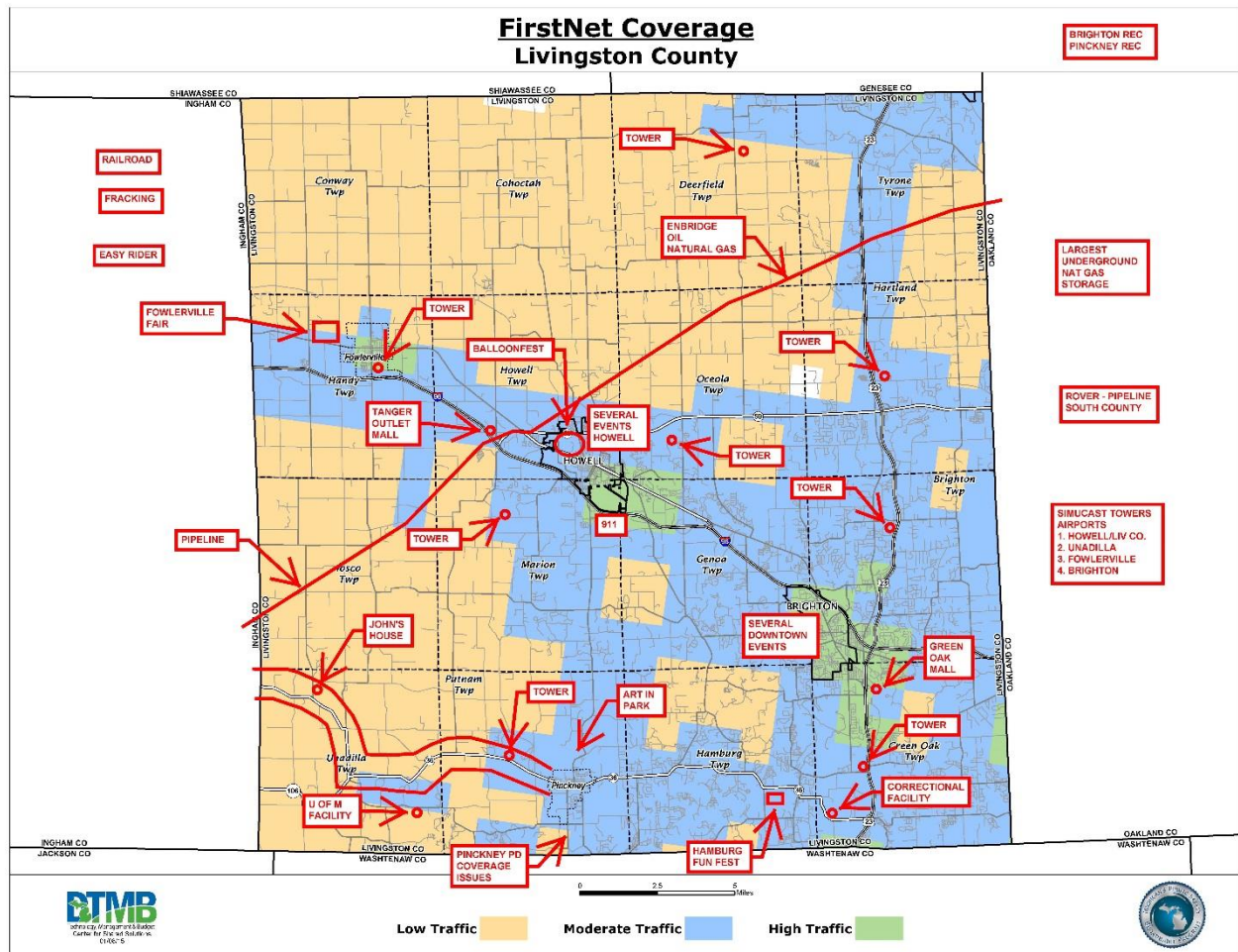


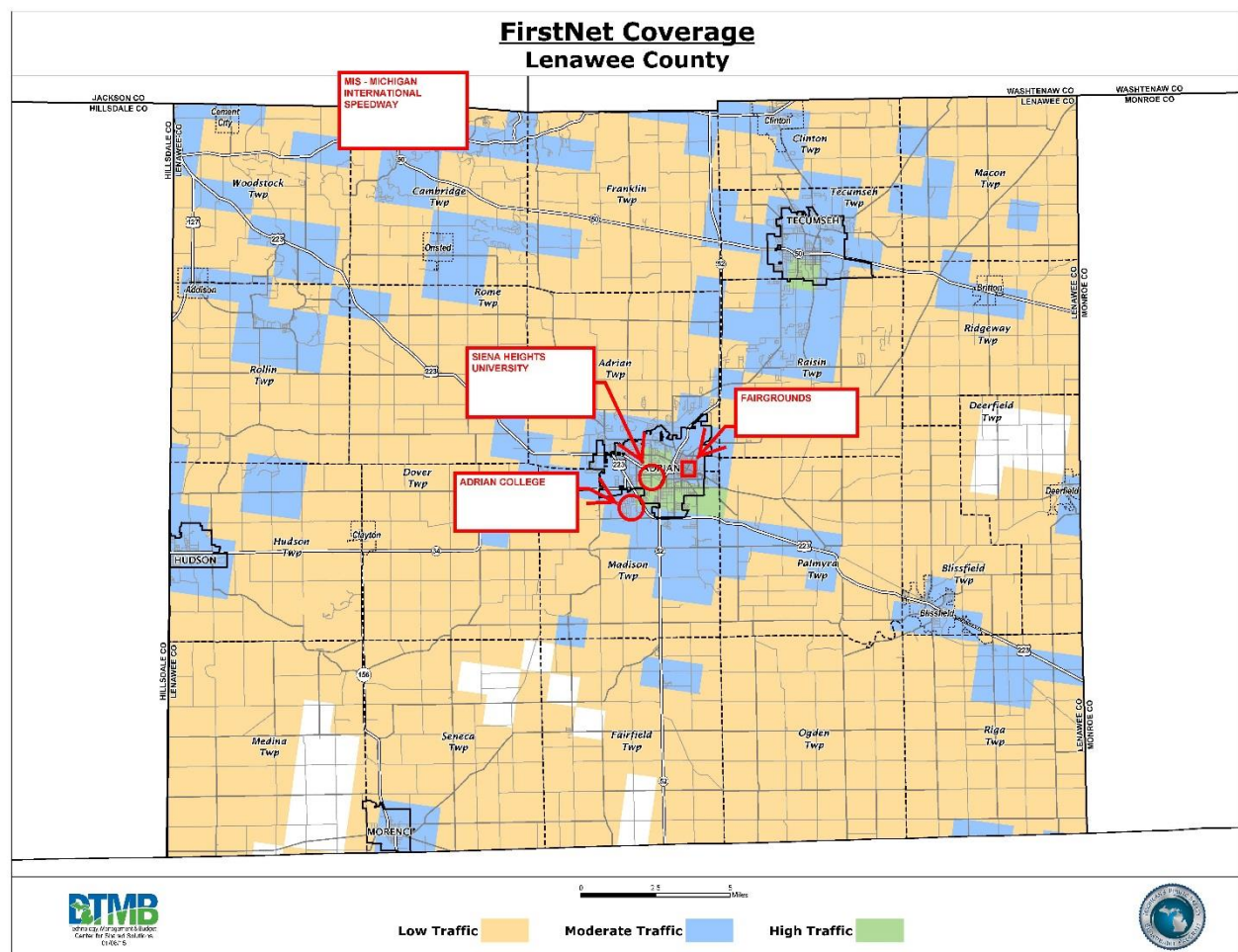


FirstNet Coverage
Macomb County



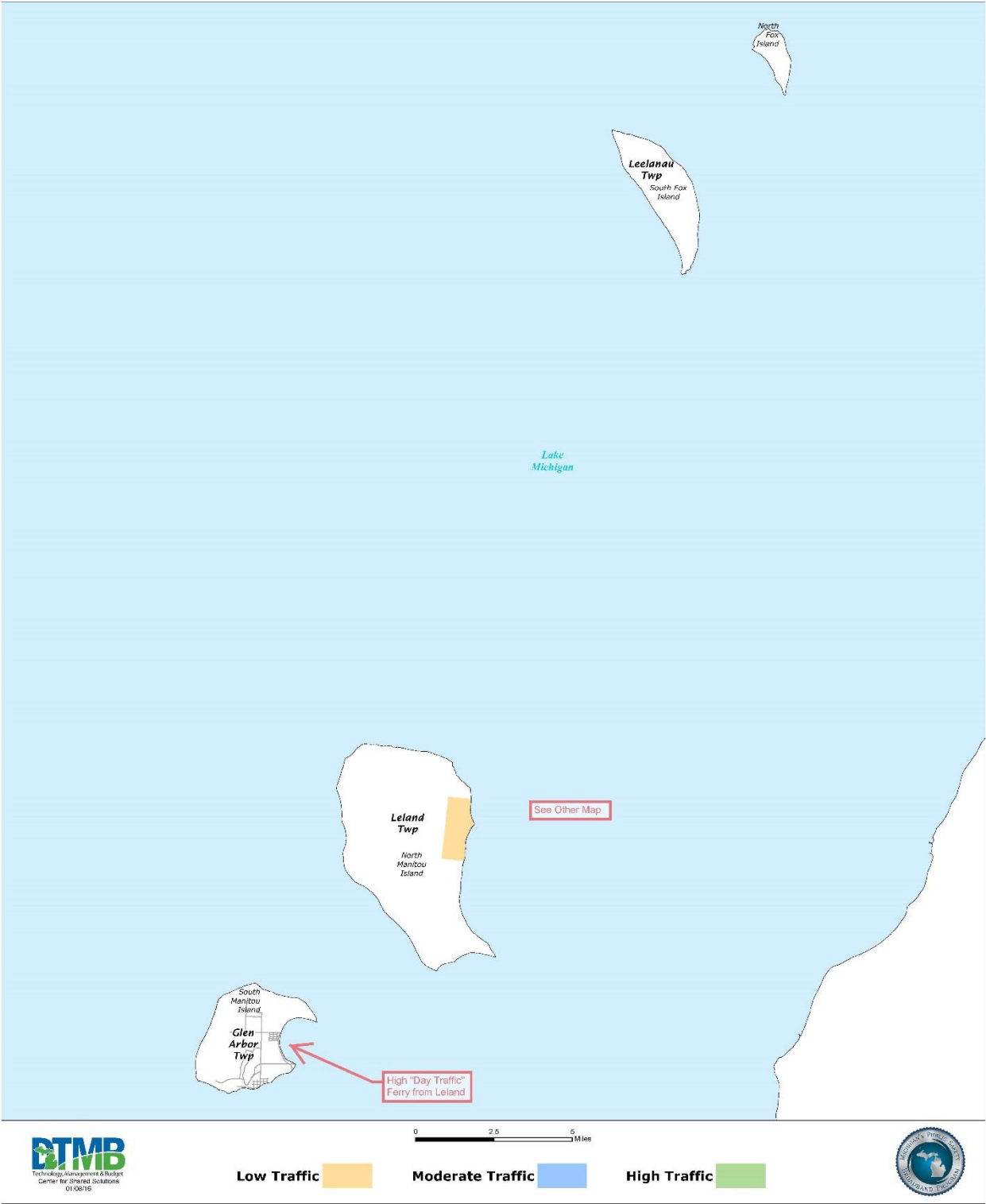






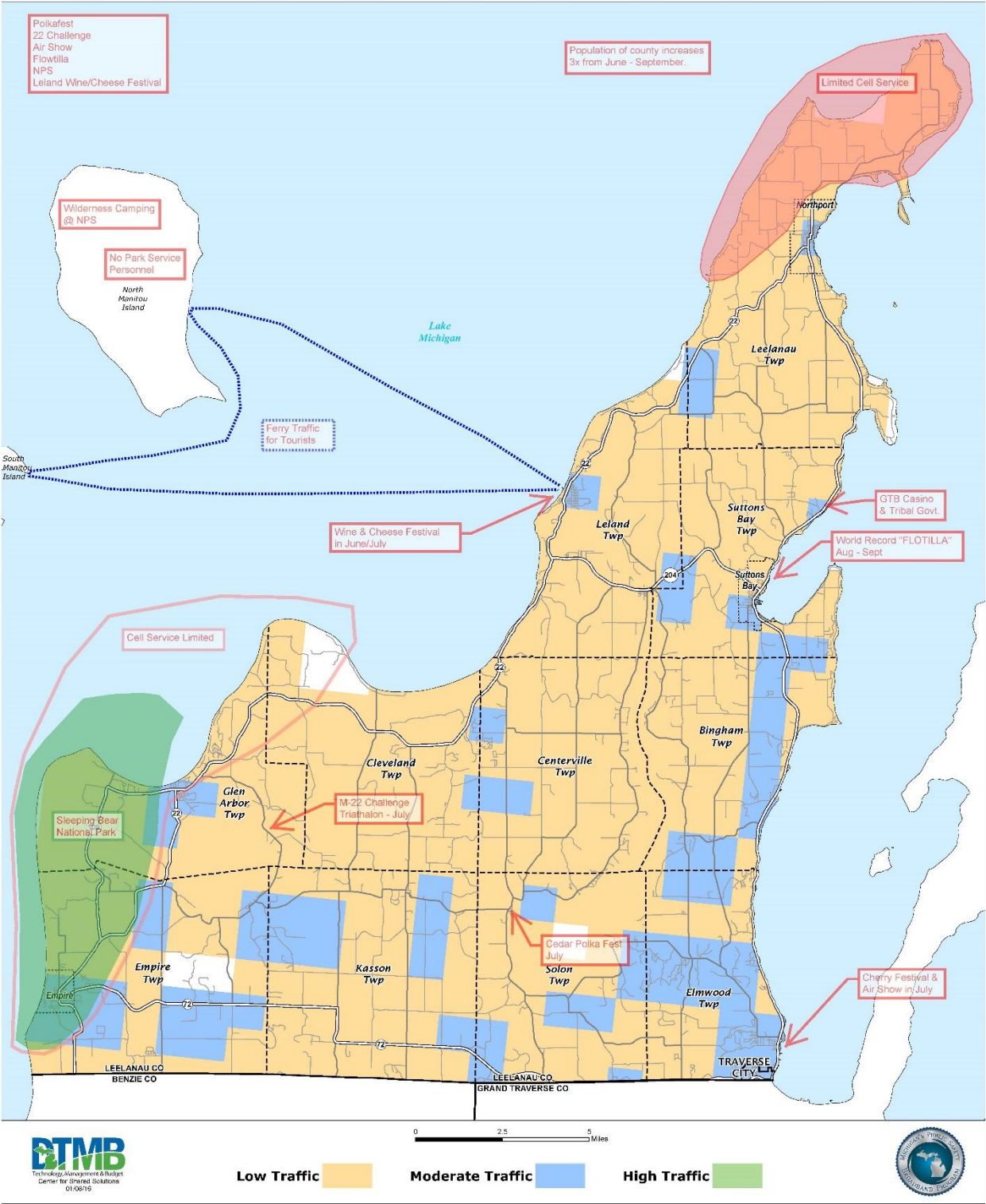


FirstNet Coverage
Leelanau County



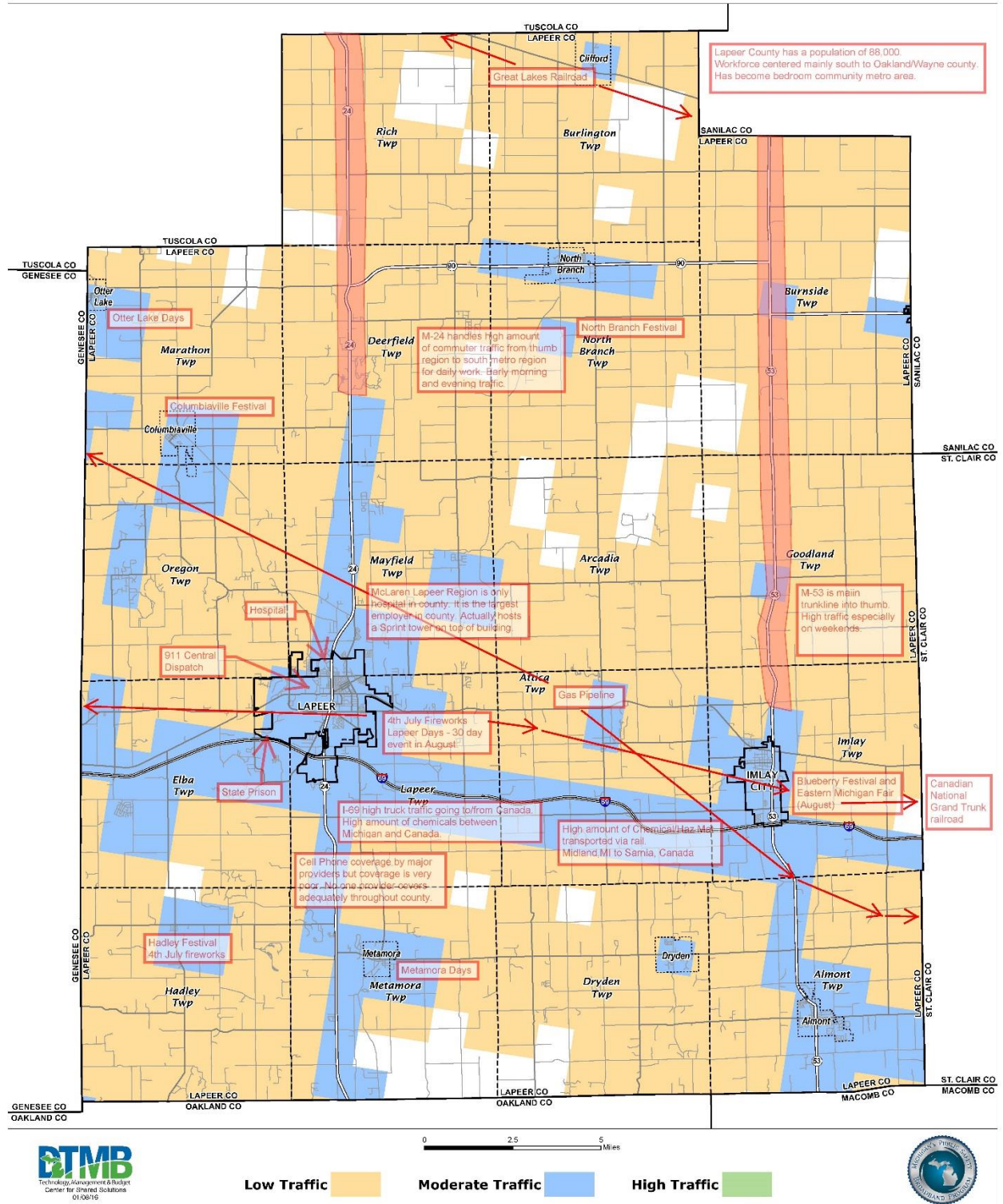


FirstNet Coverage
Leelanau County



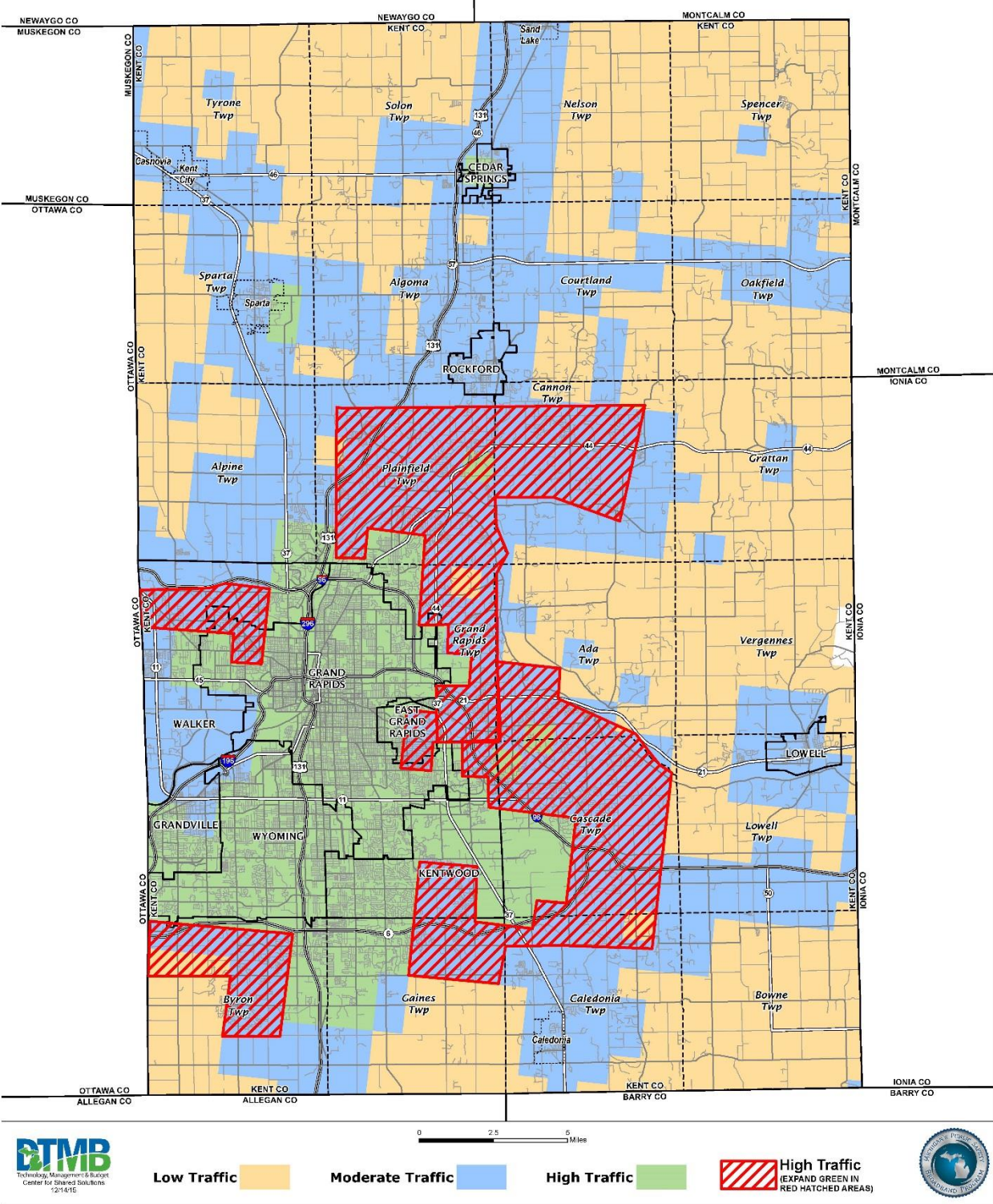


FirstNet Coverage Lapeer County



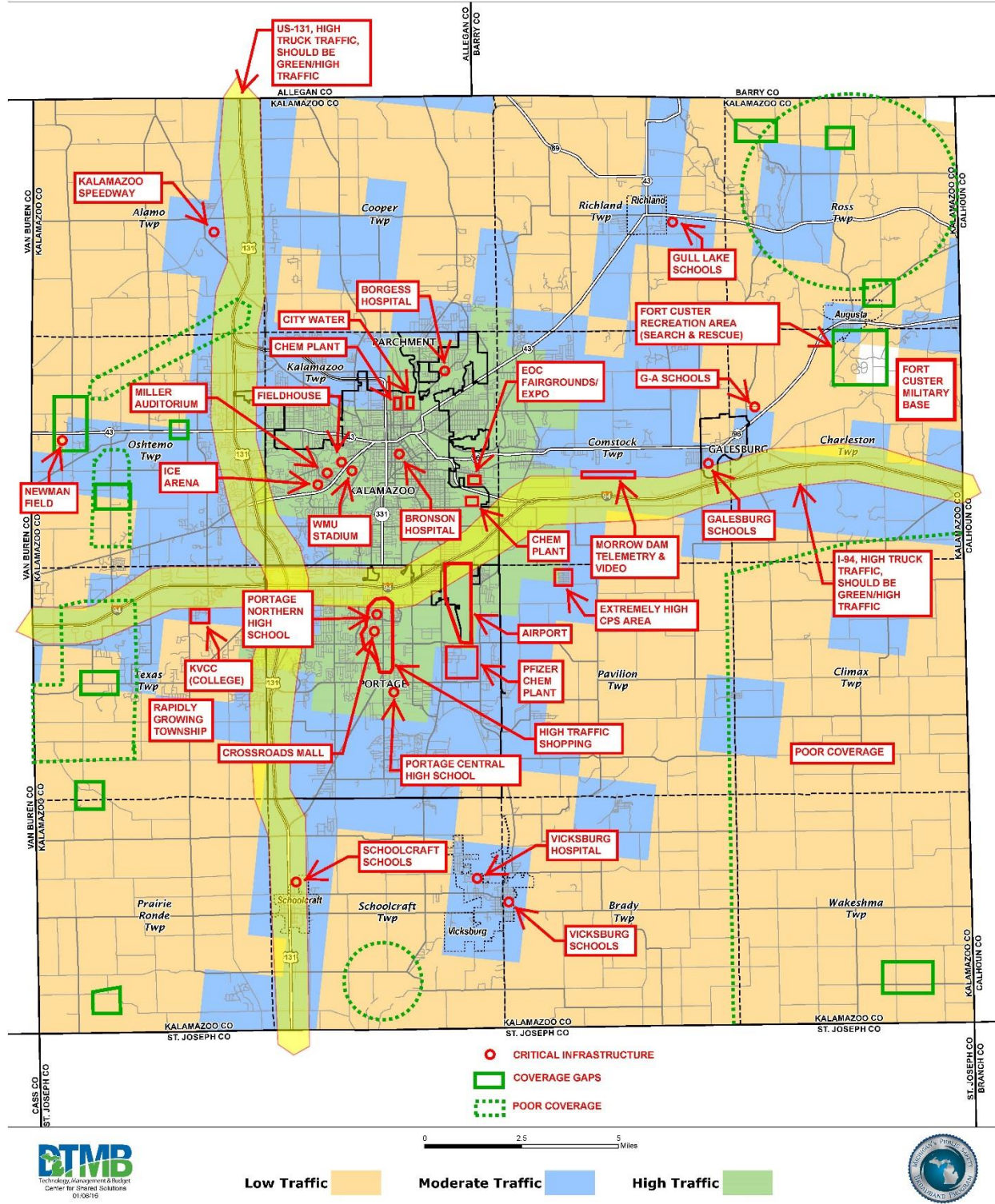


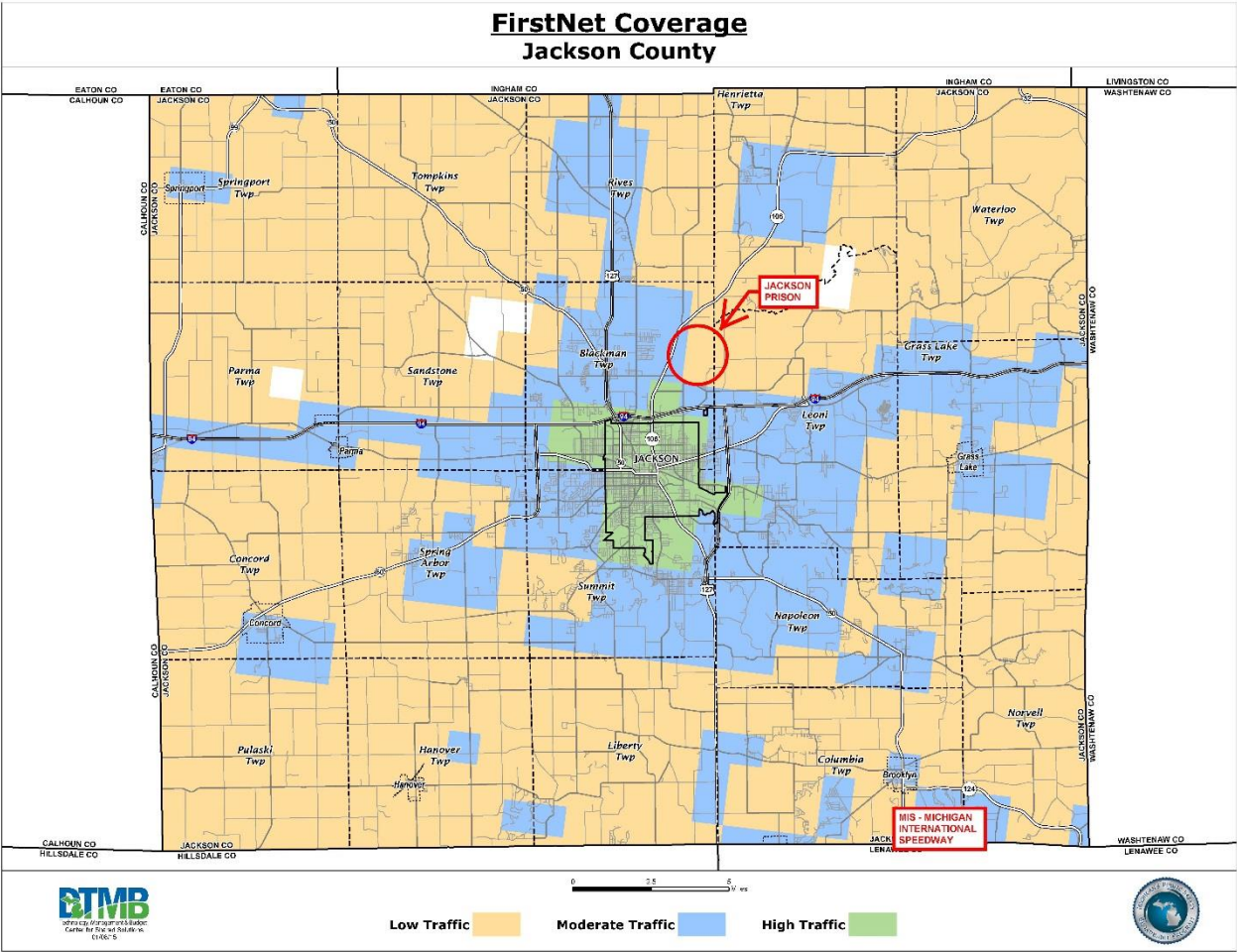
FirstNet Coverage
Kent County

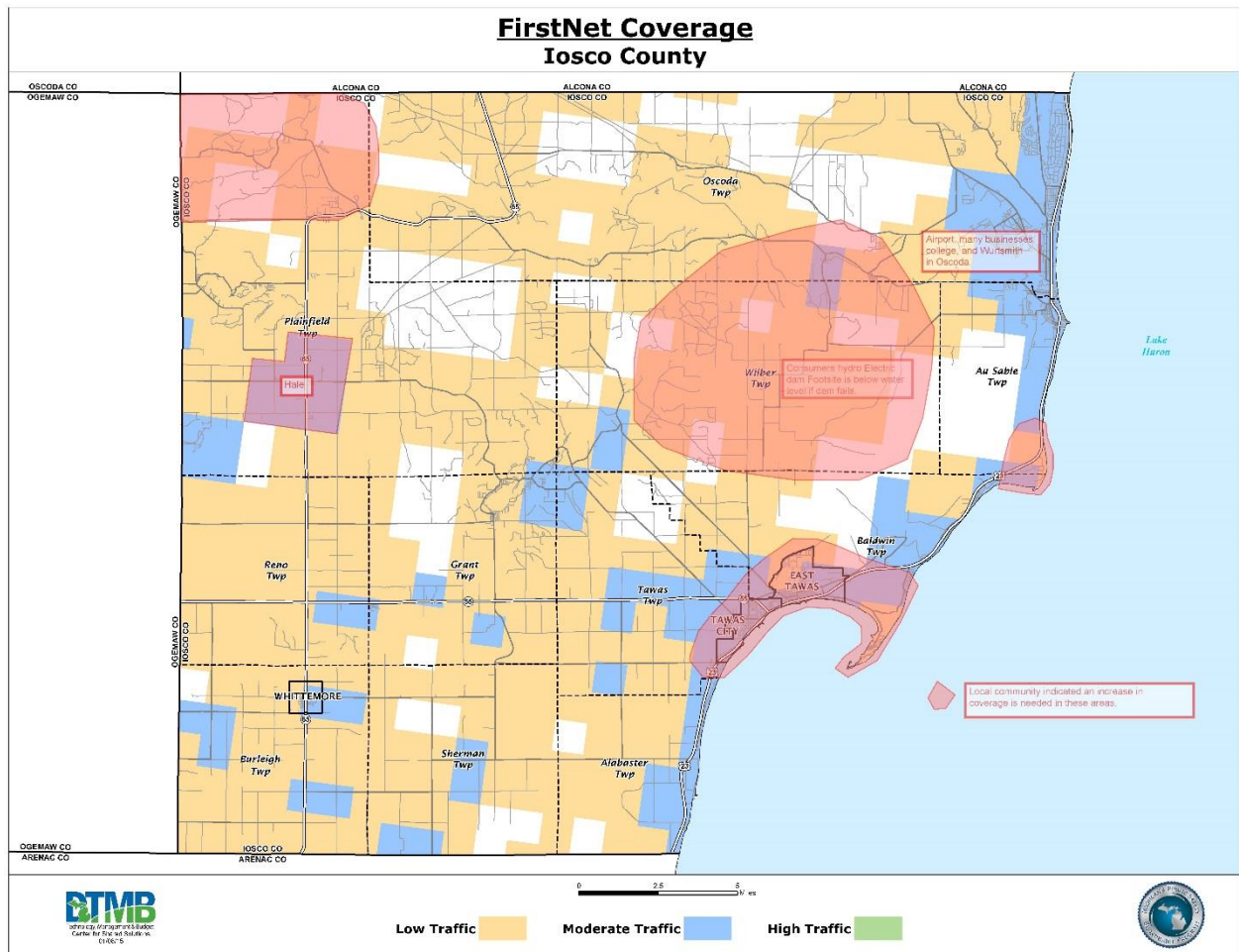


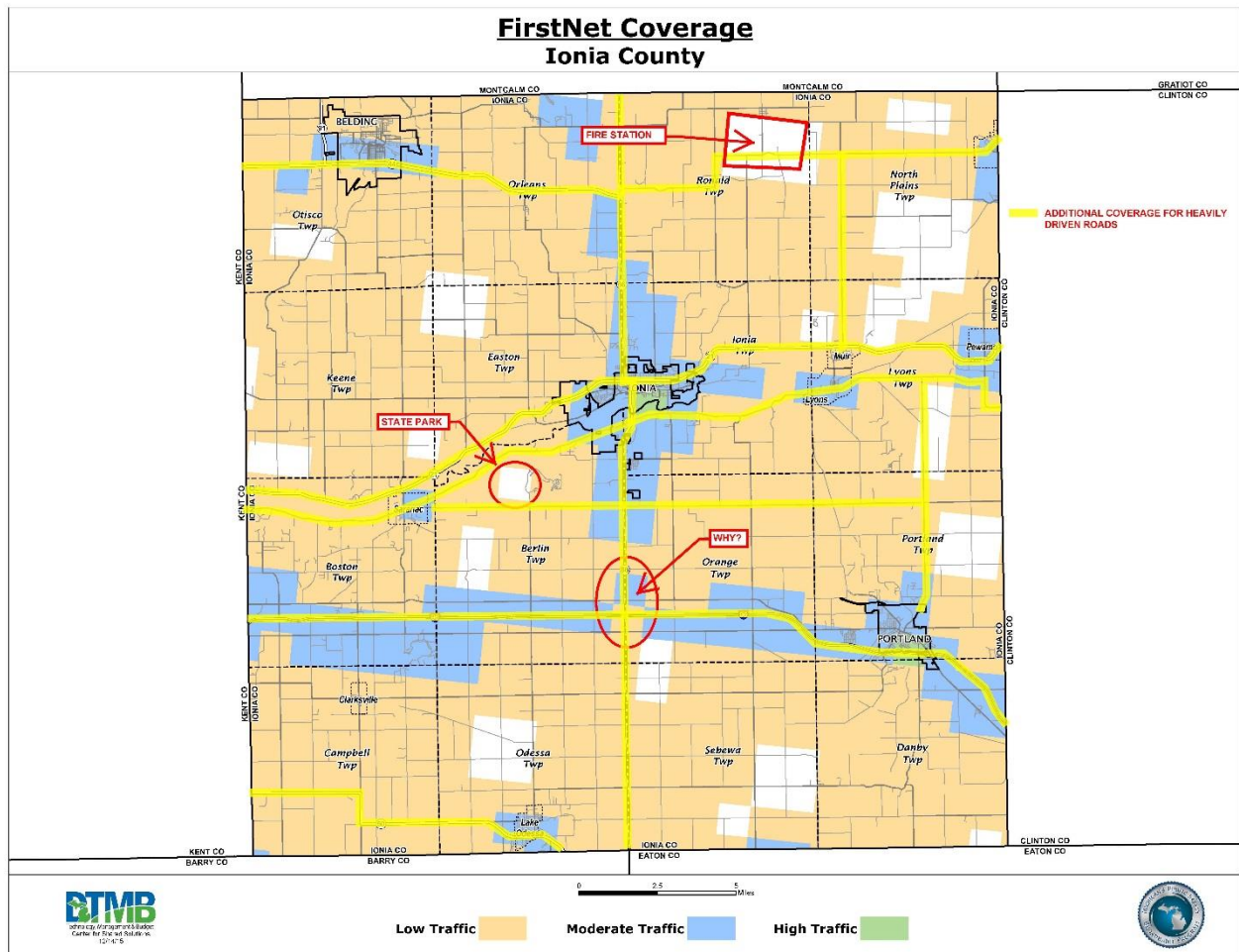


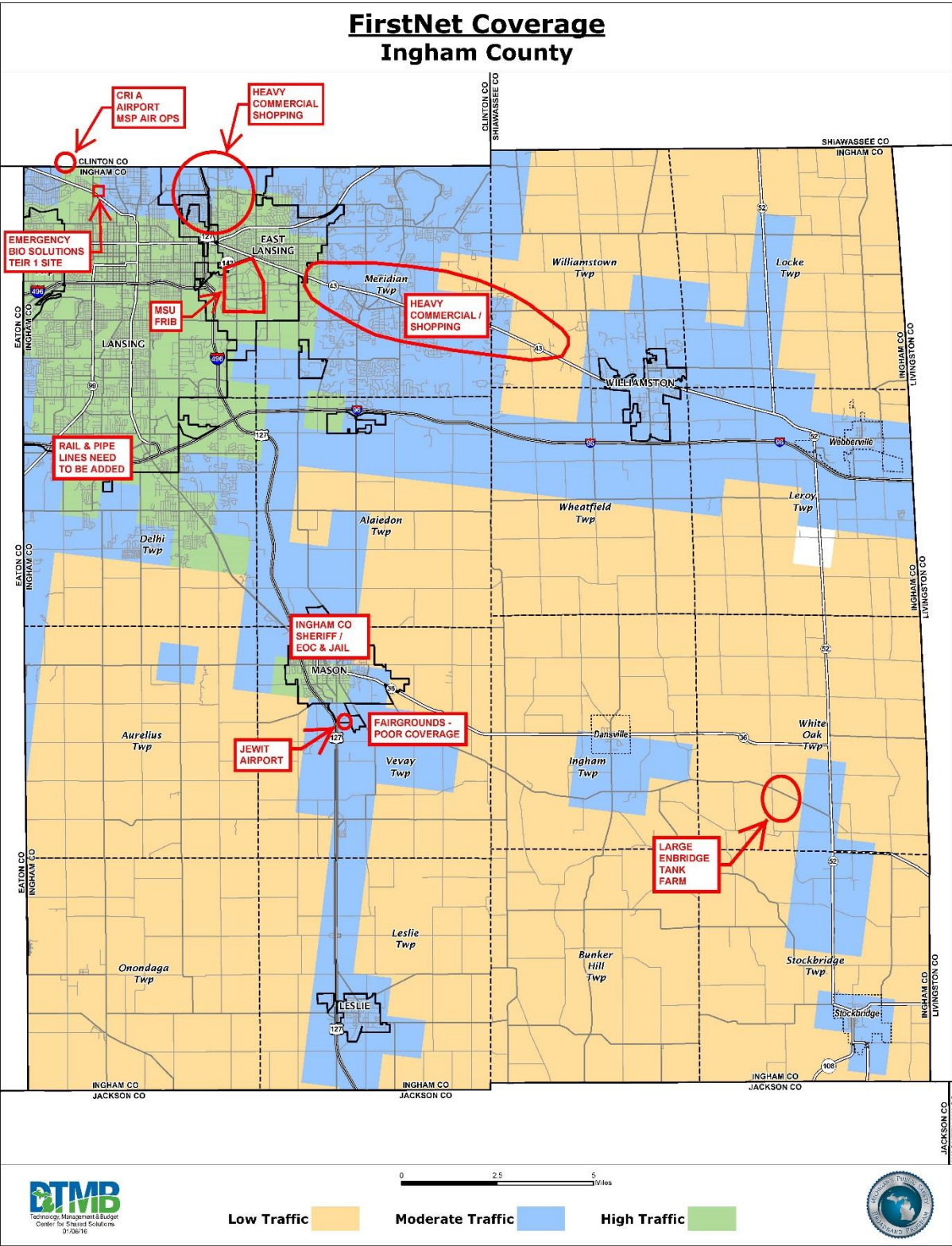
FirstNet Coverage Kalamazoo County

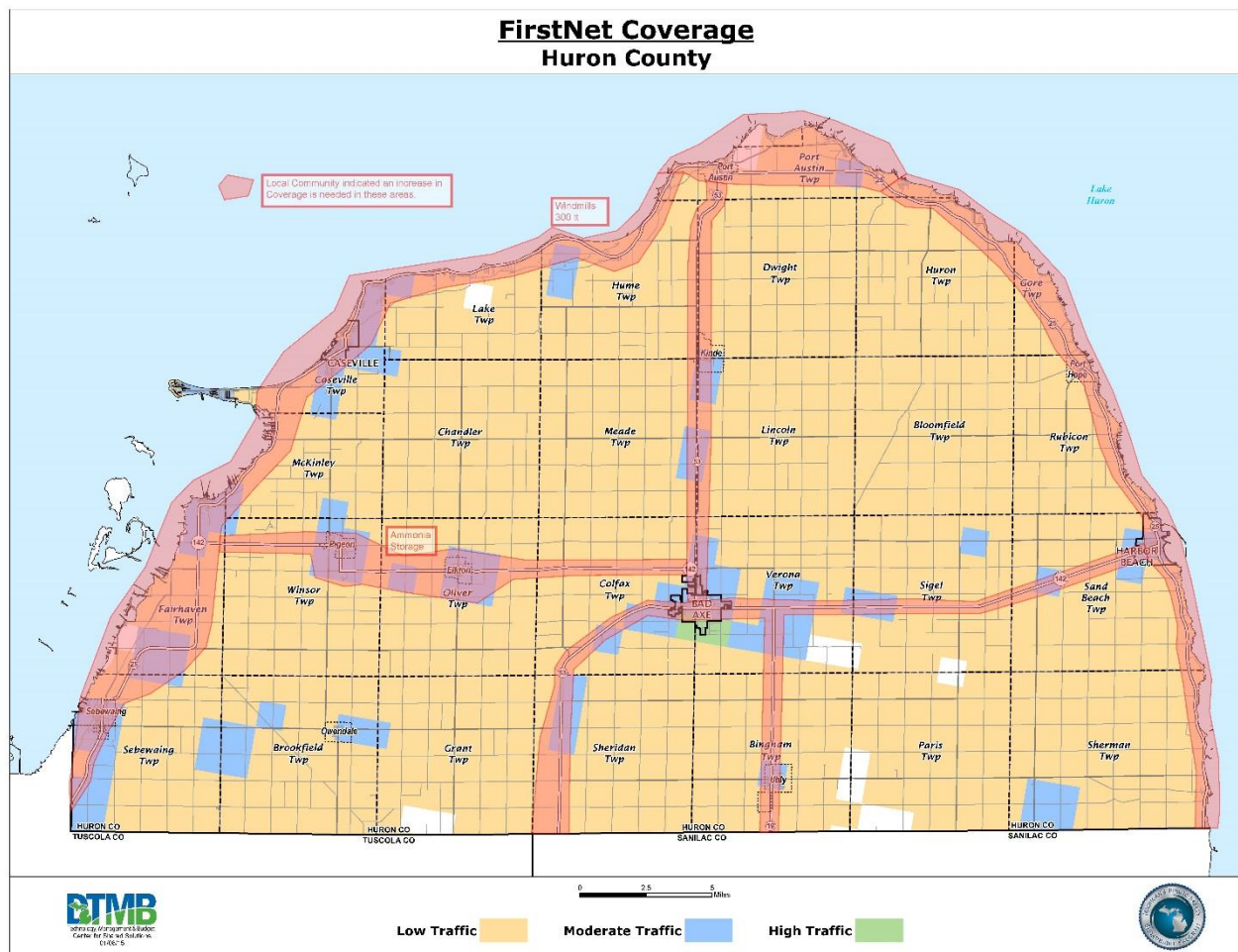


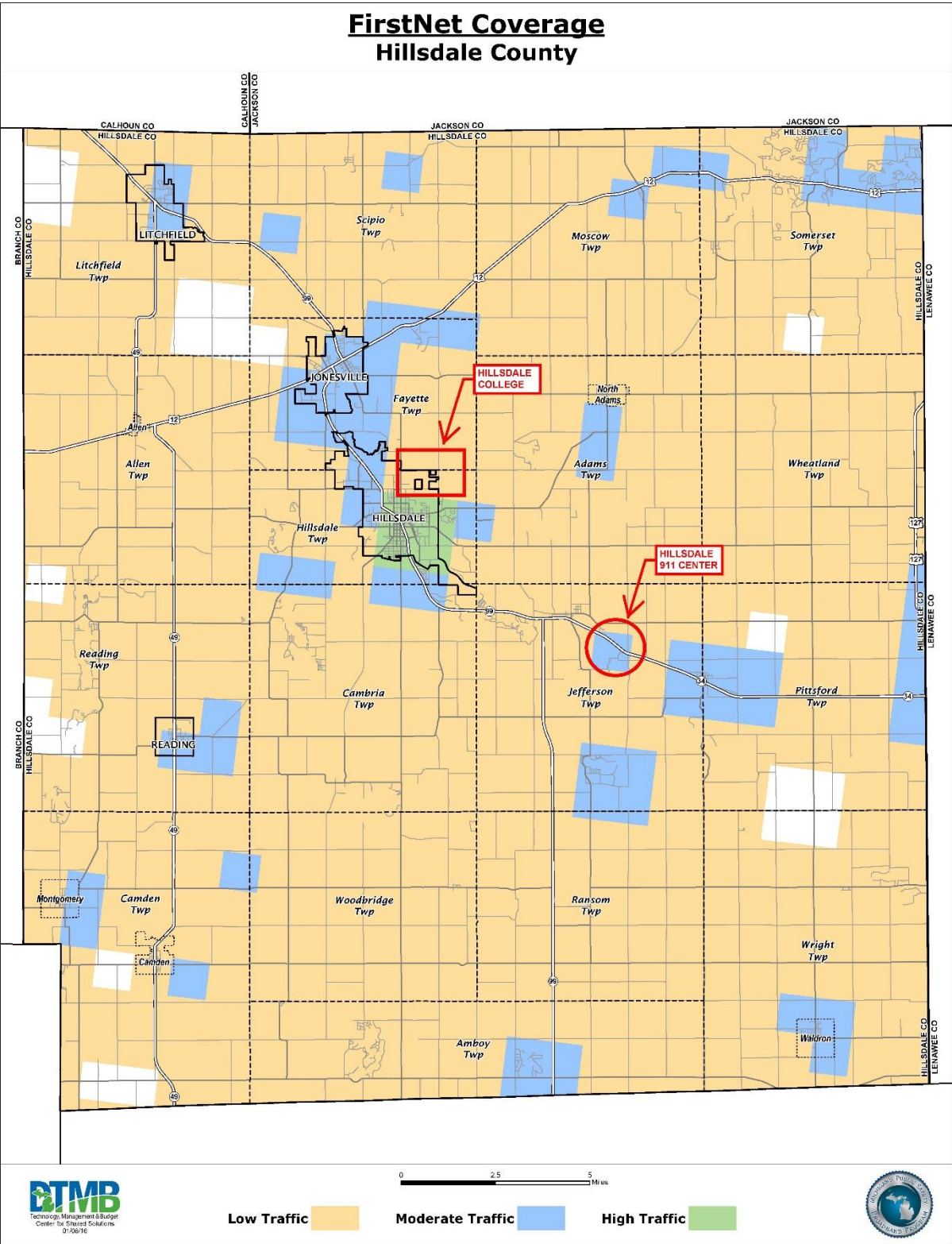


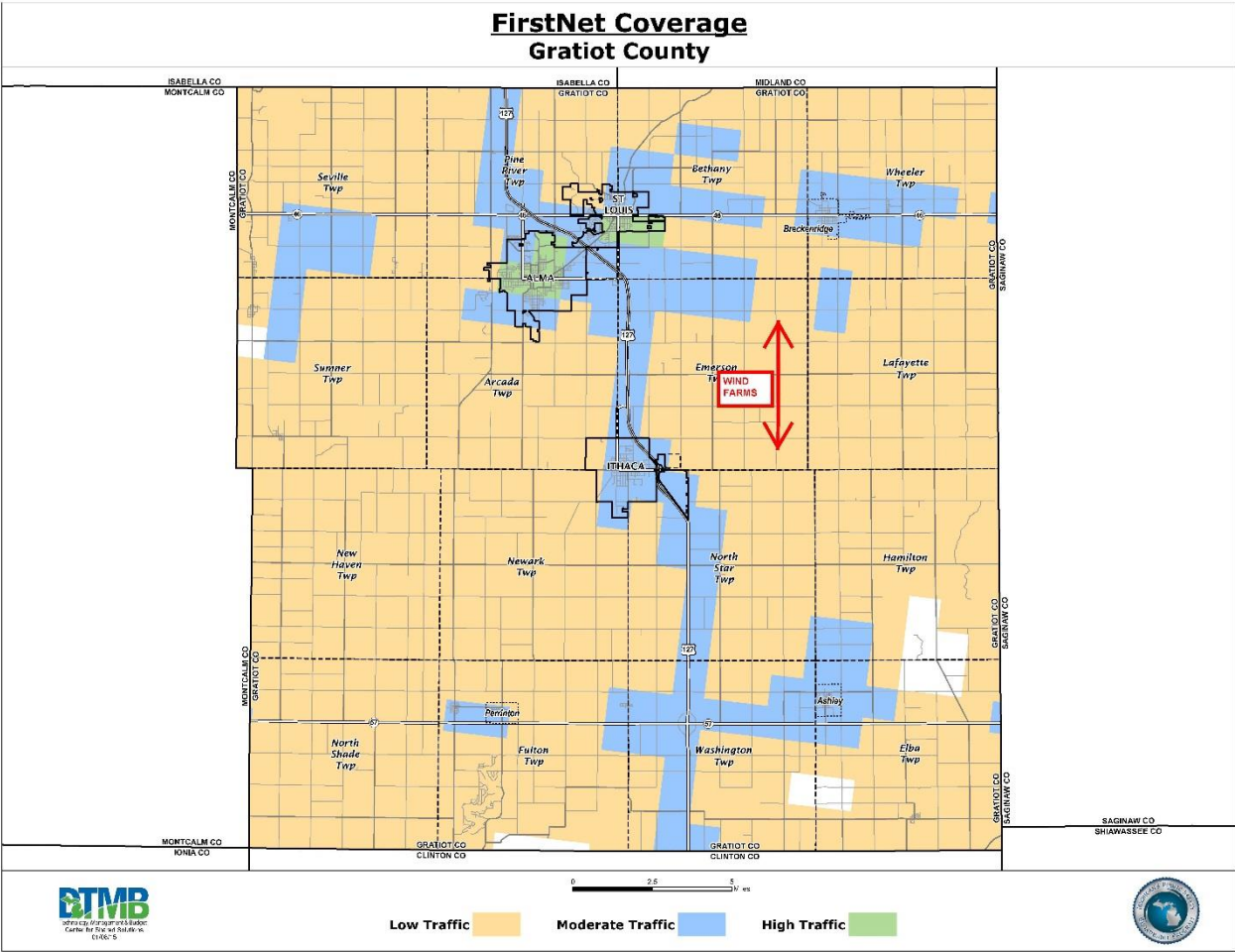


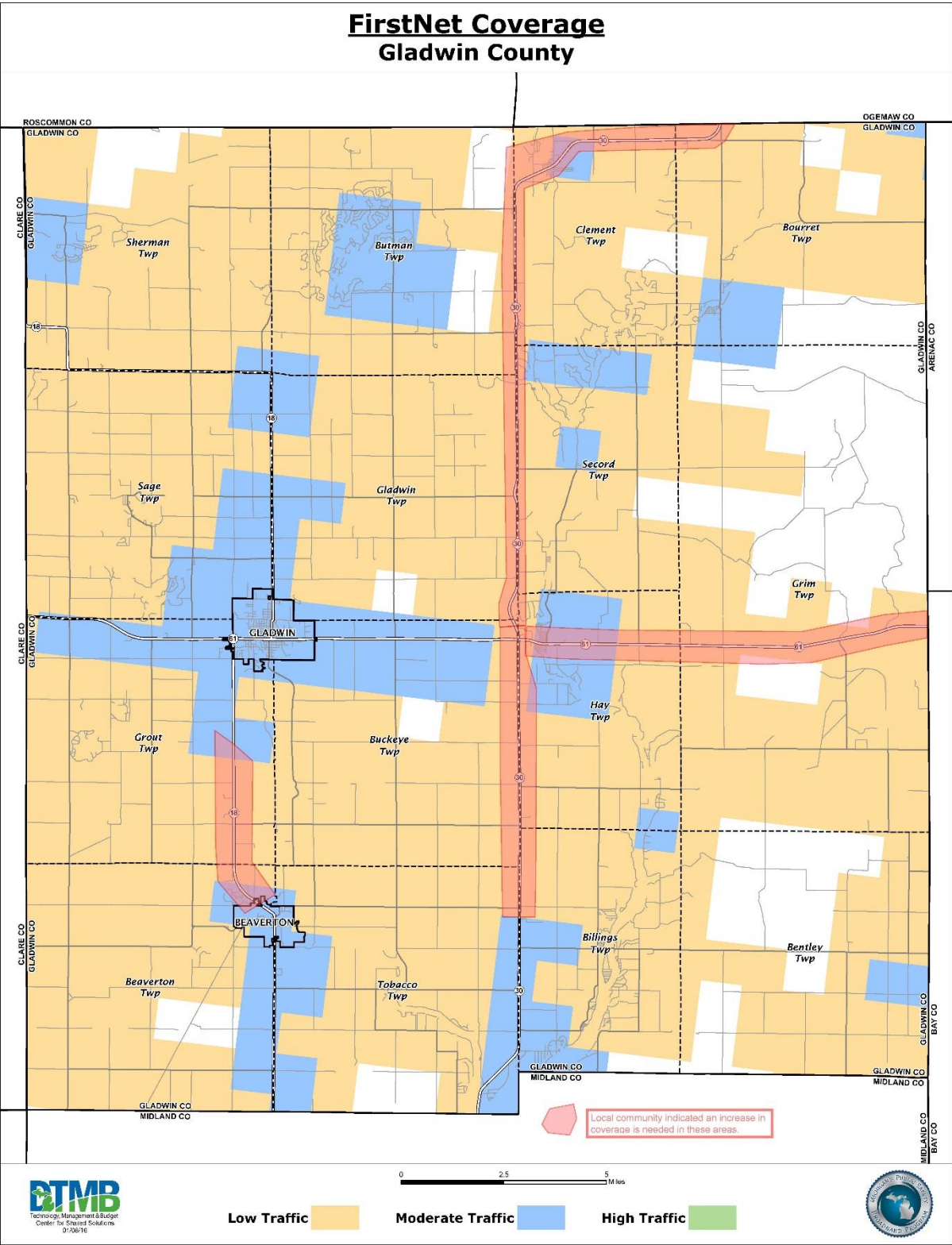


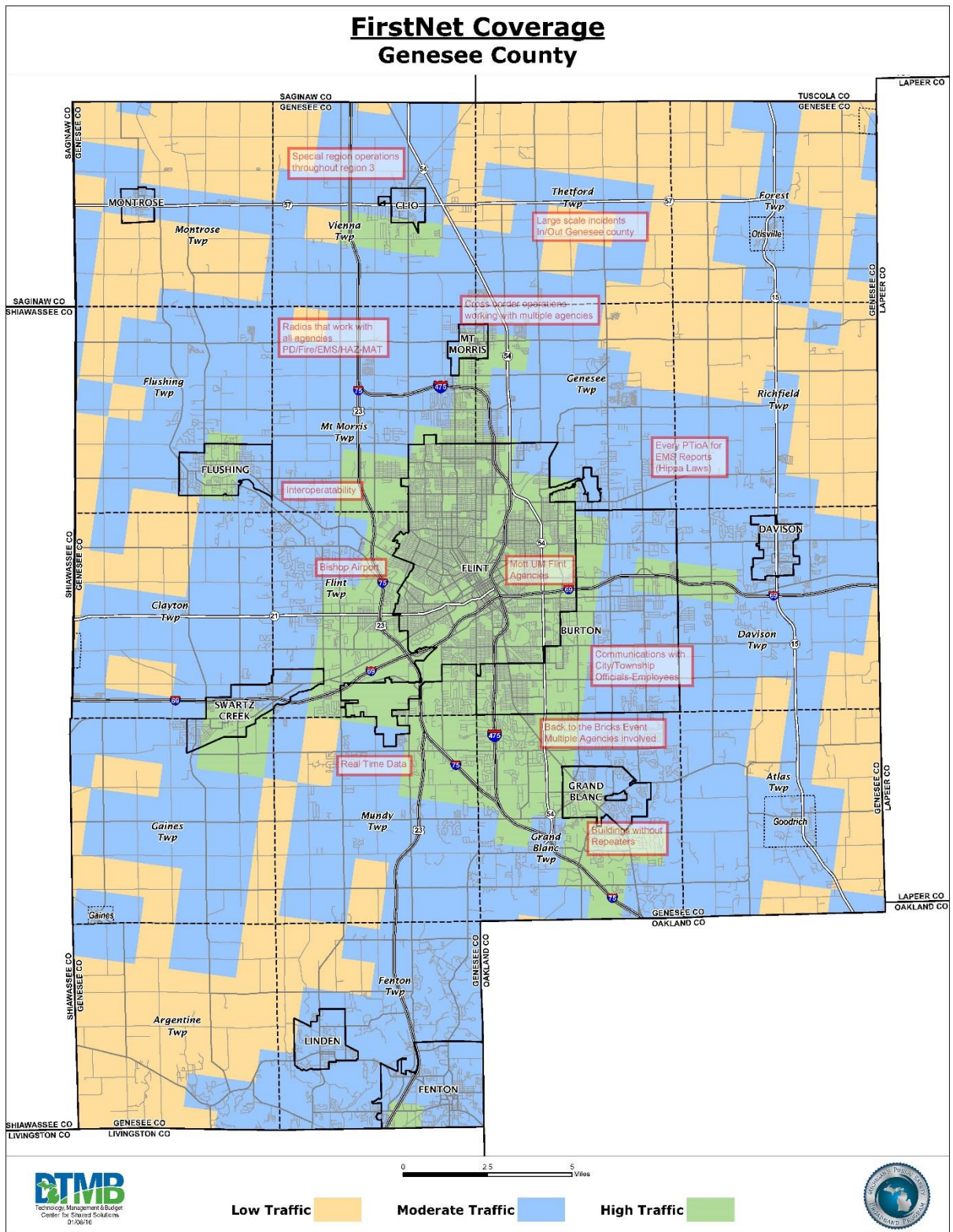


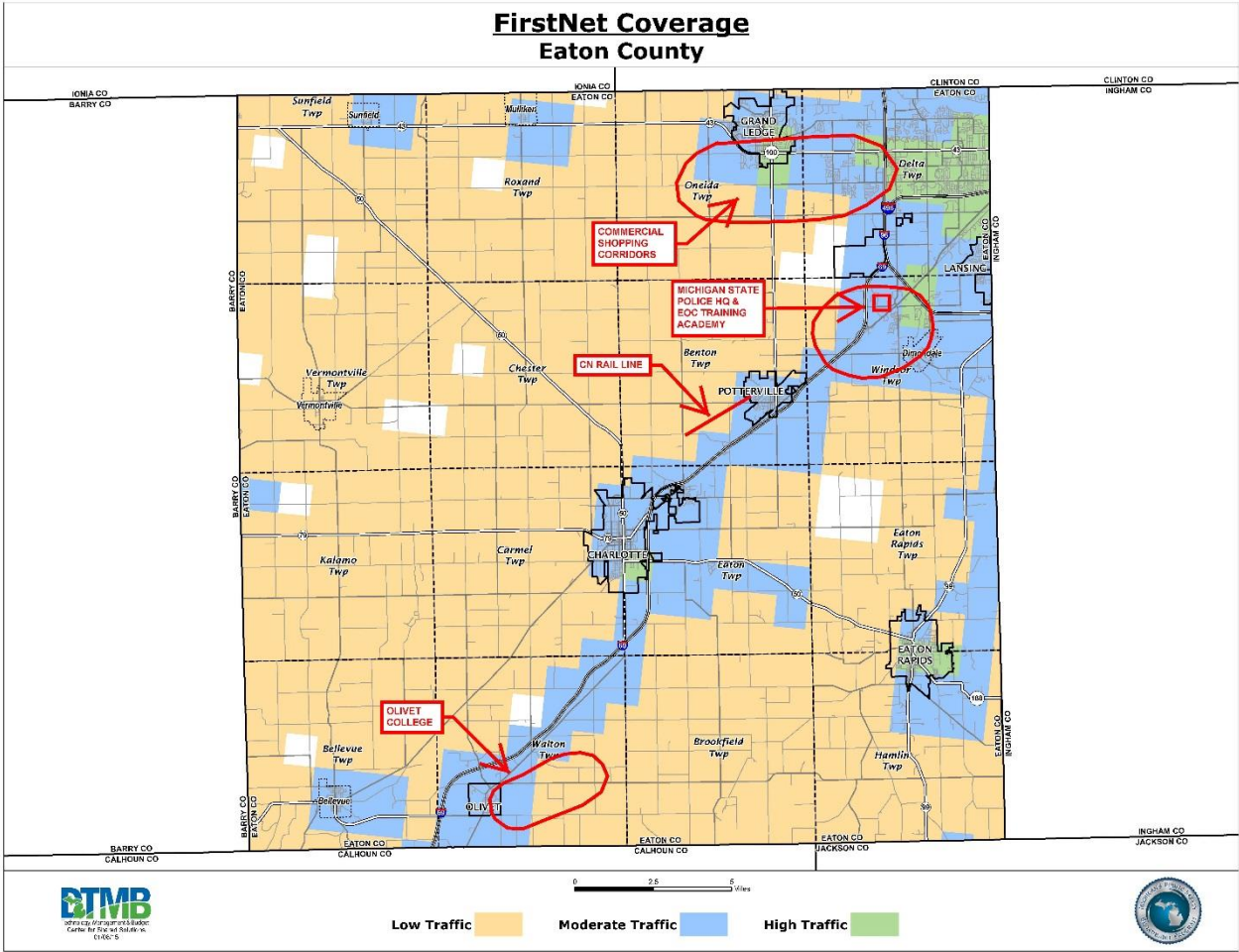


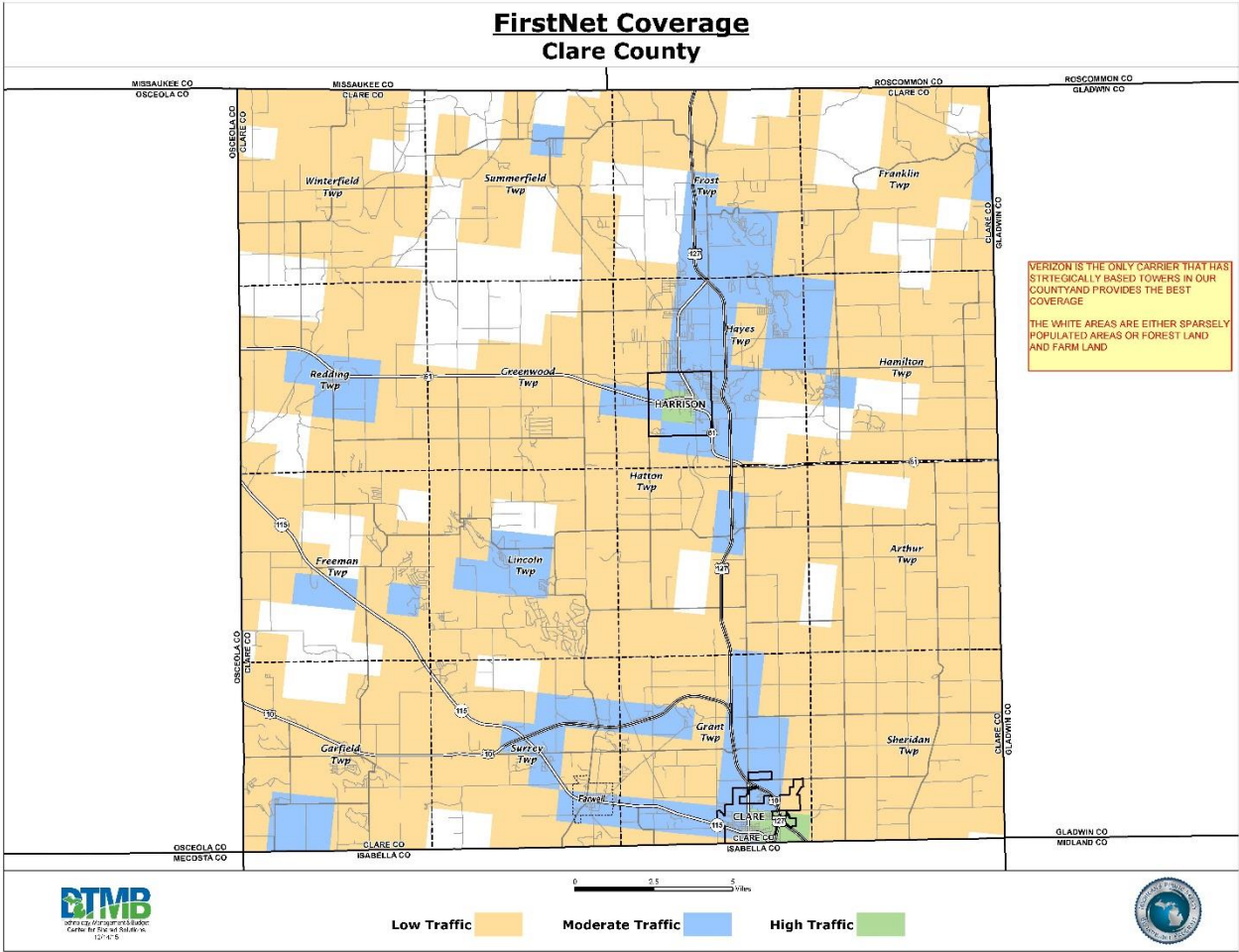


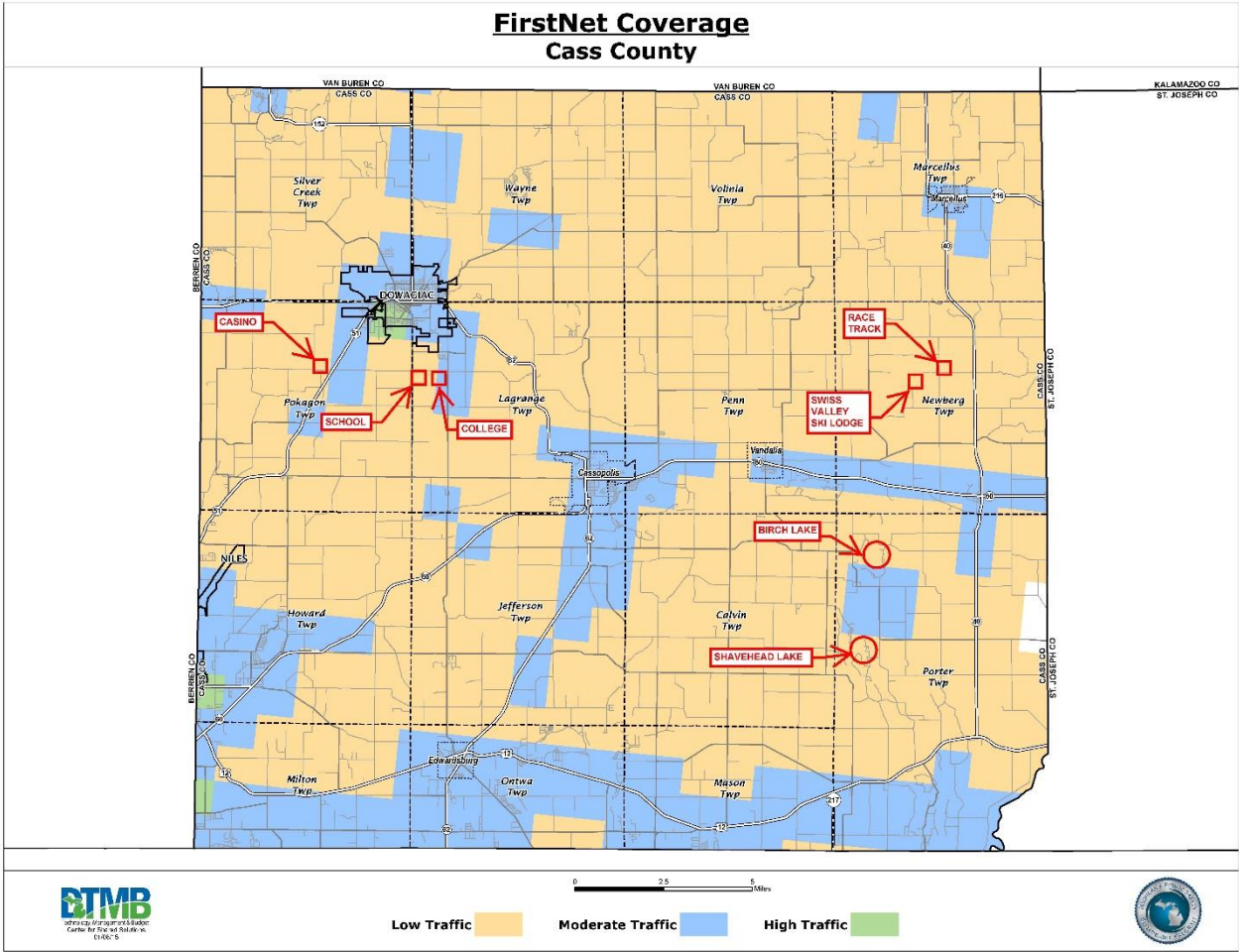


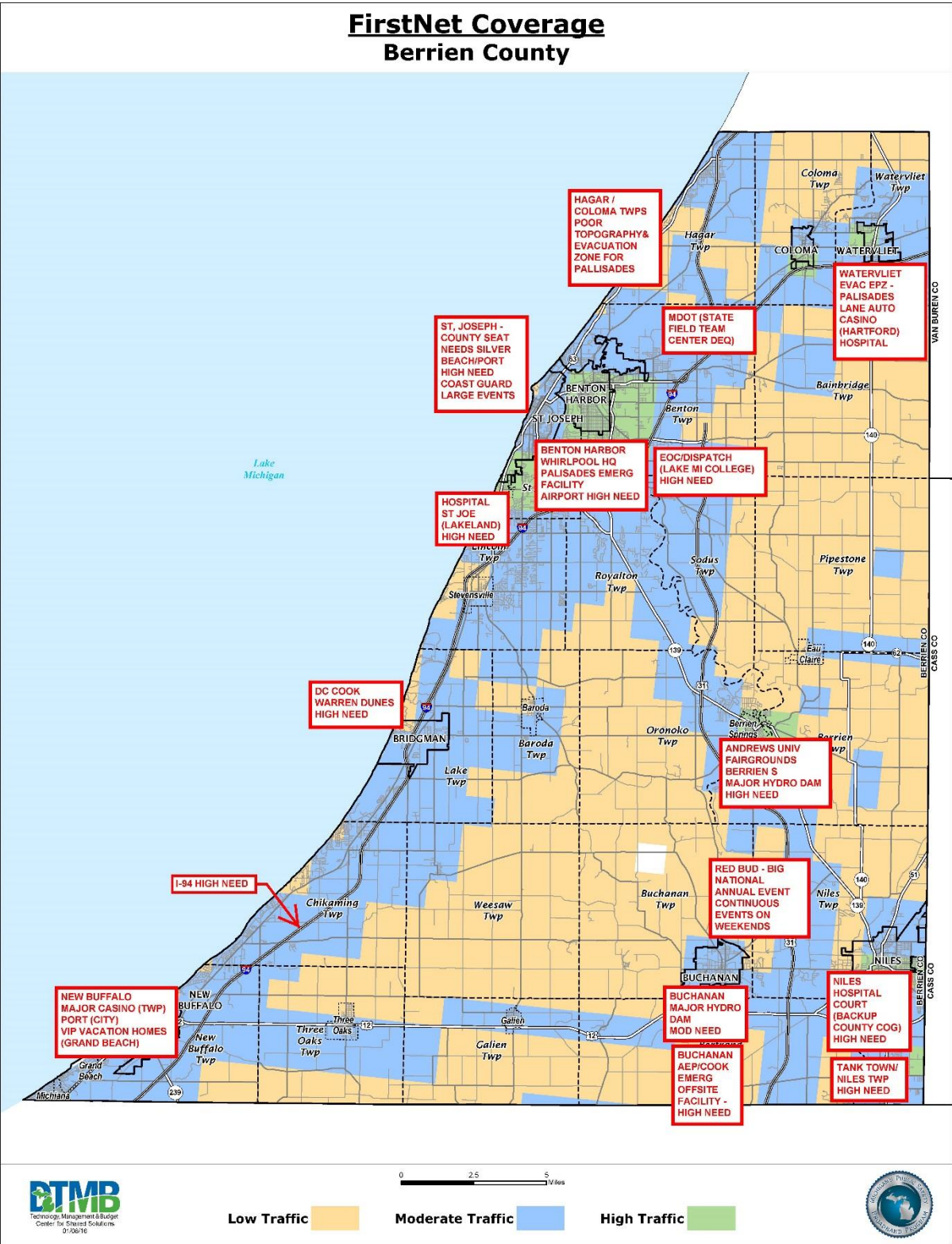


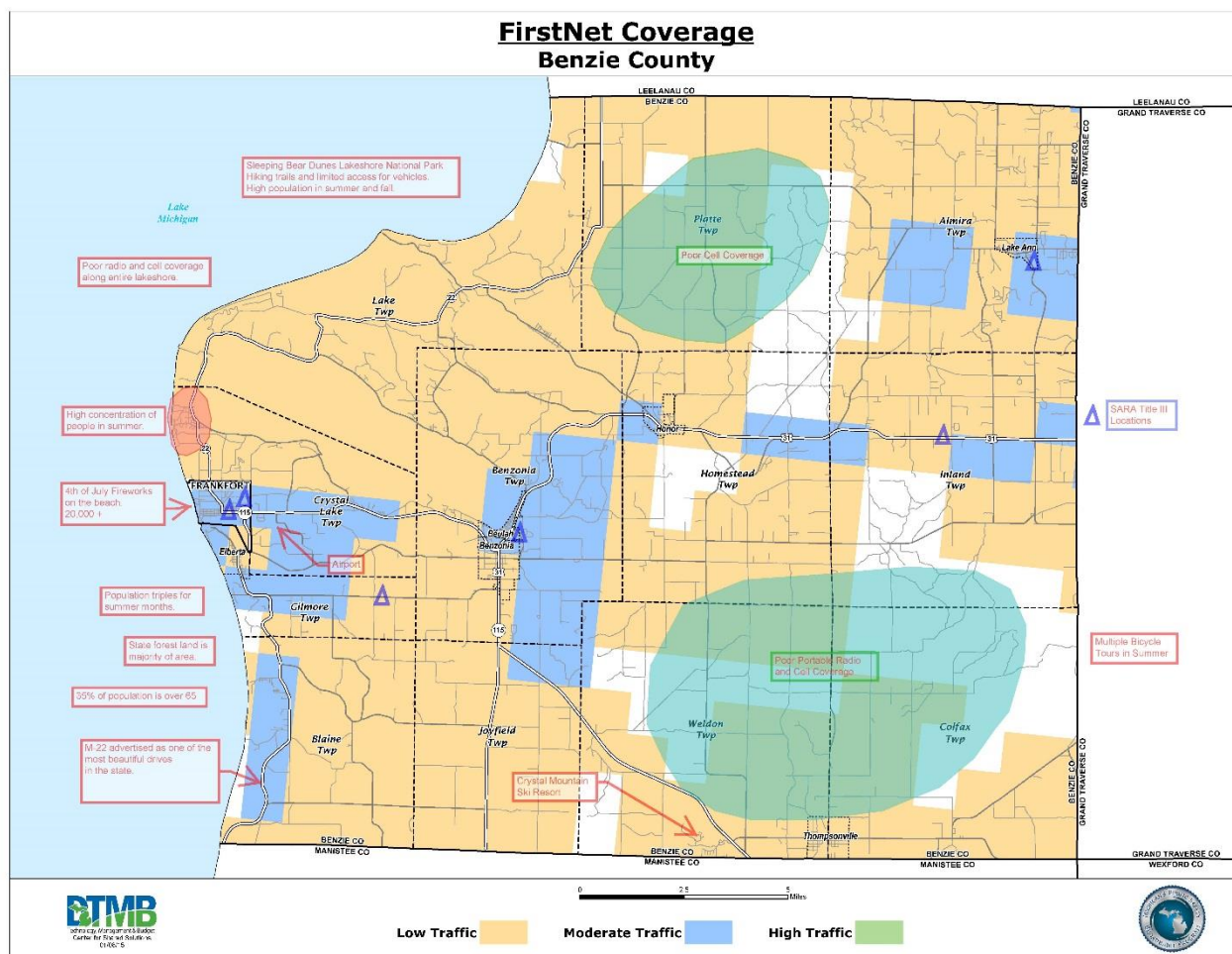






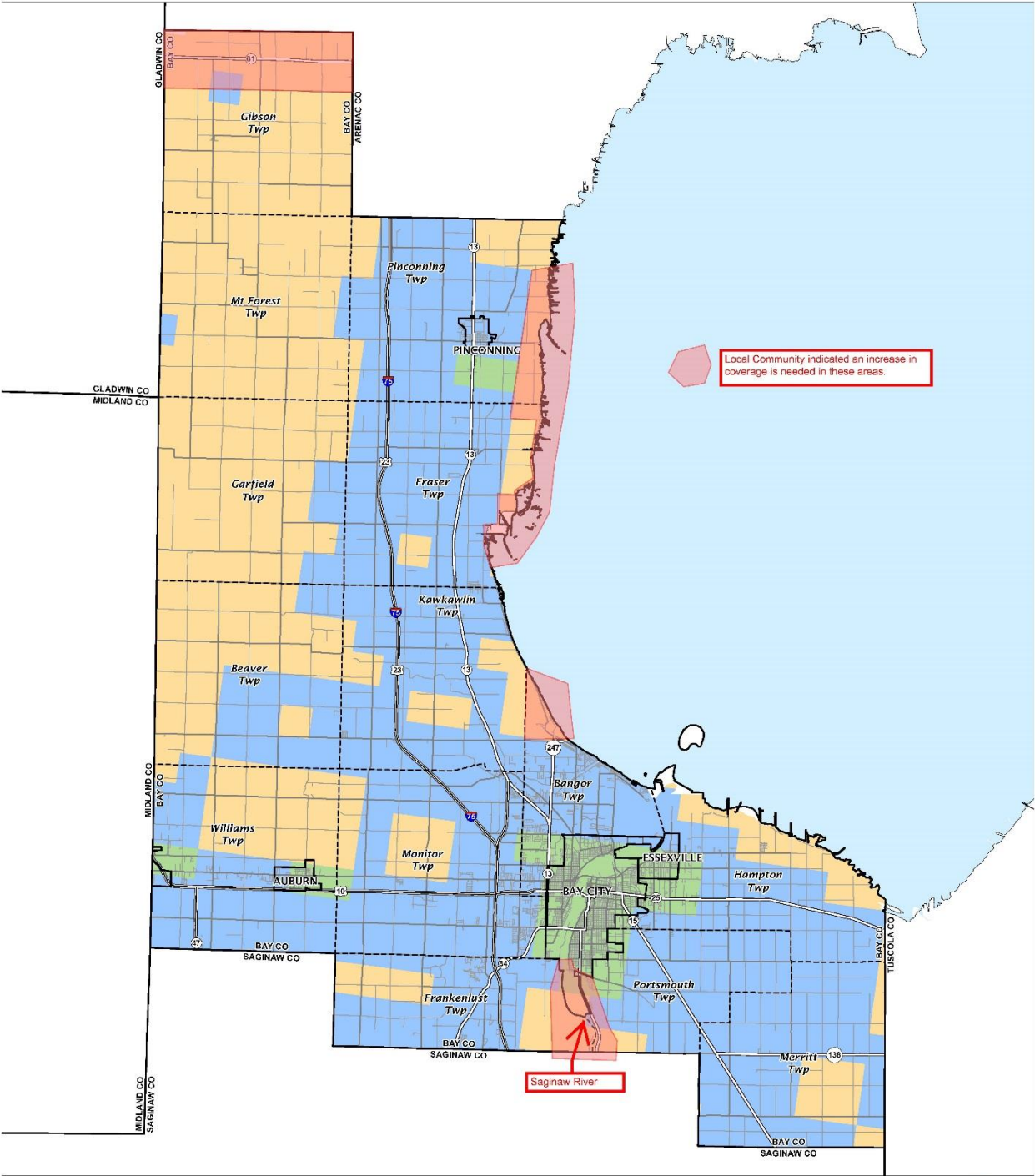






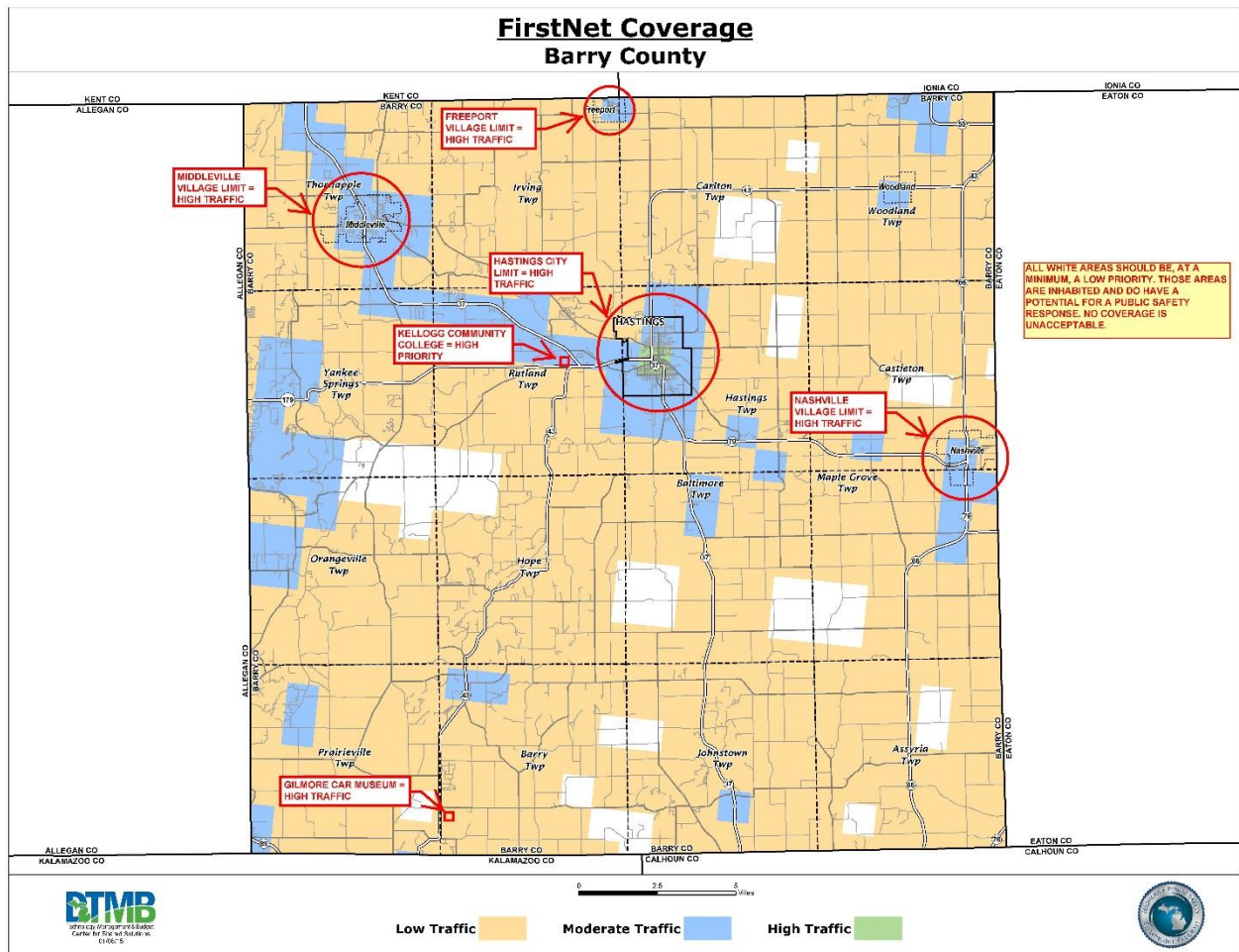


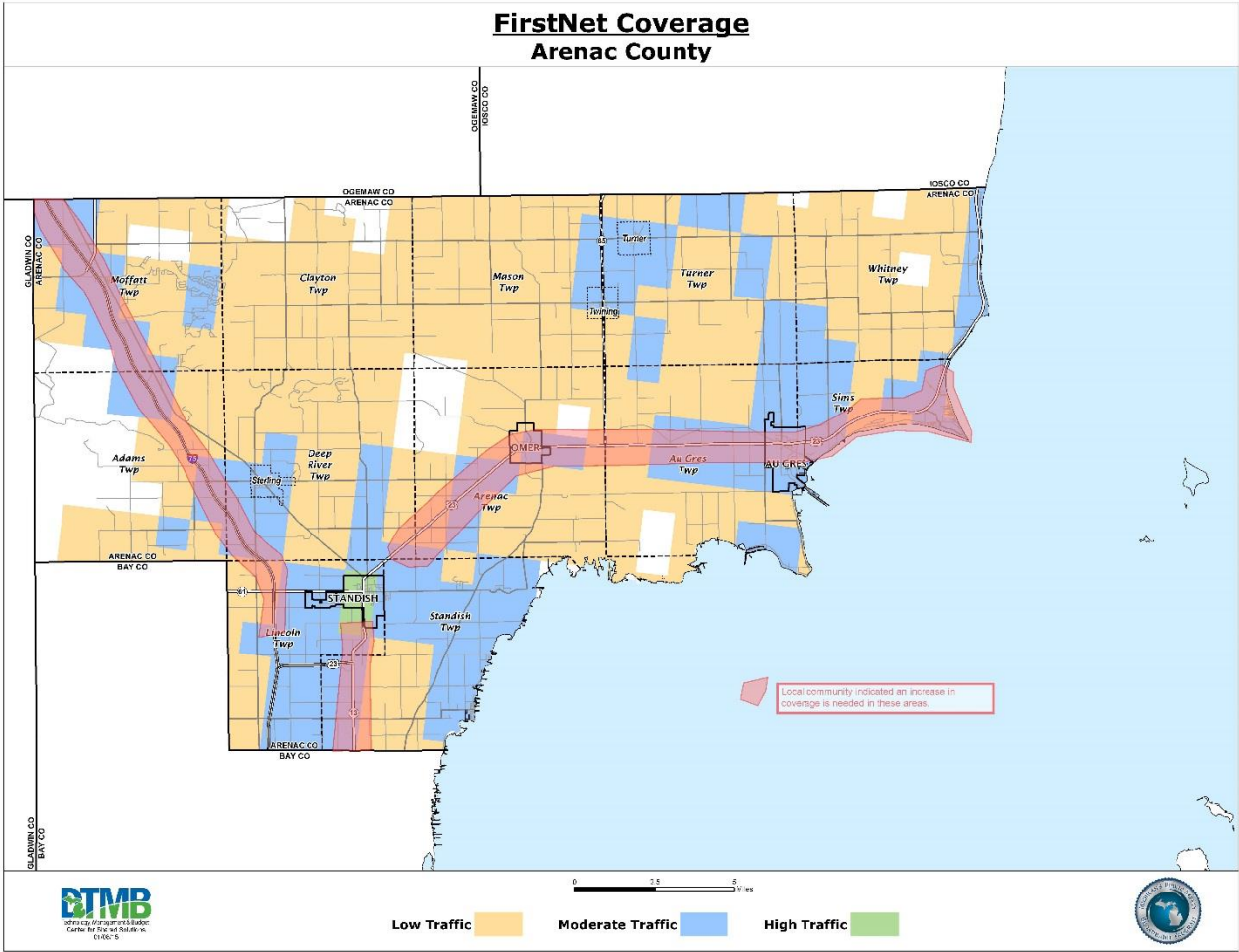
FirstNet Coverage
Bay County

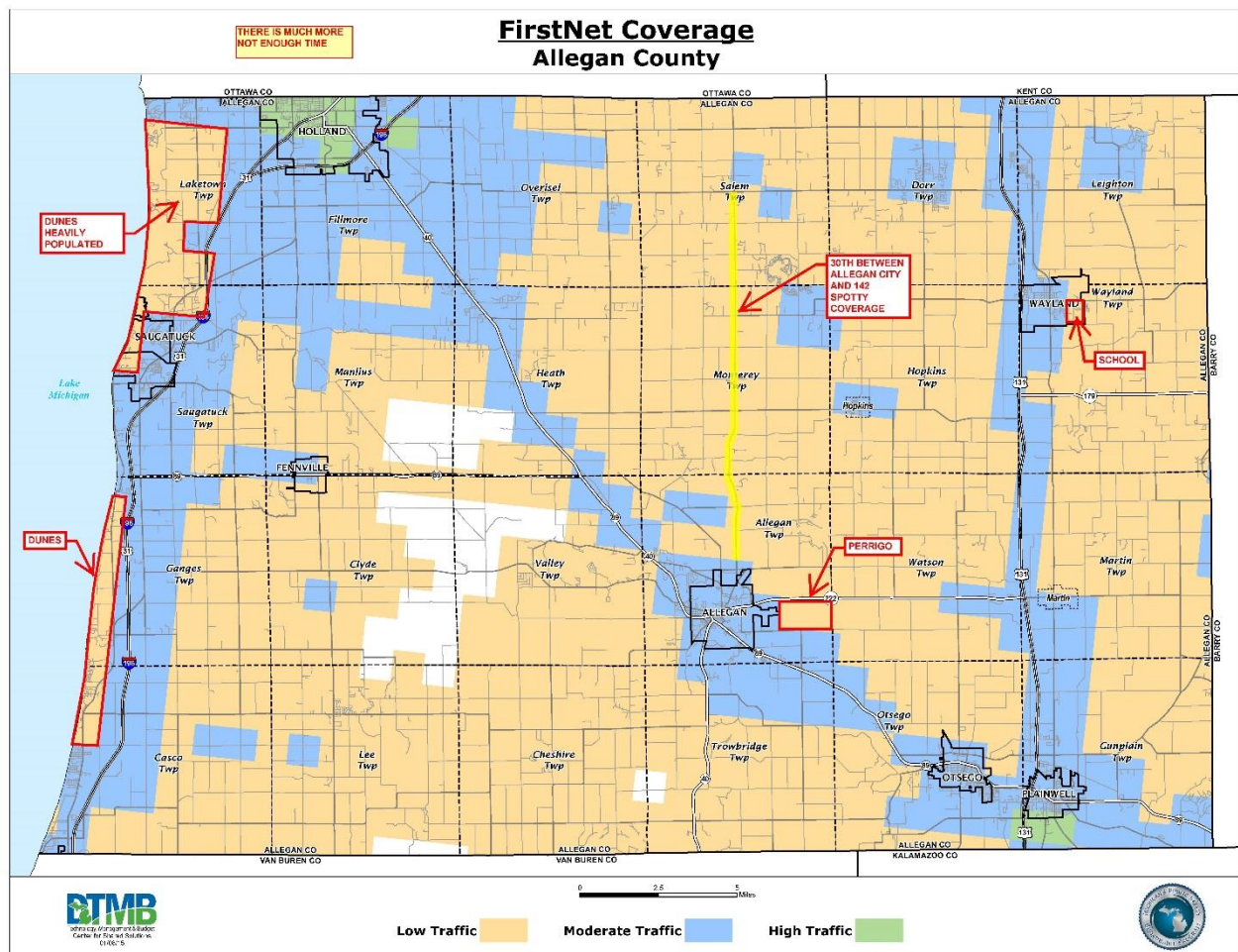


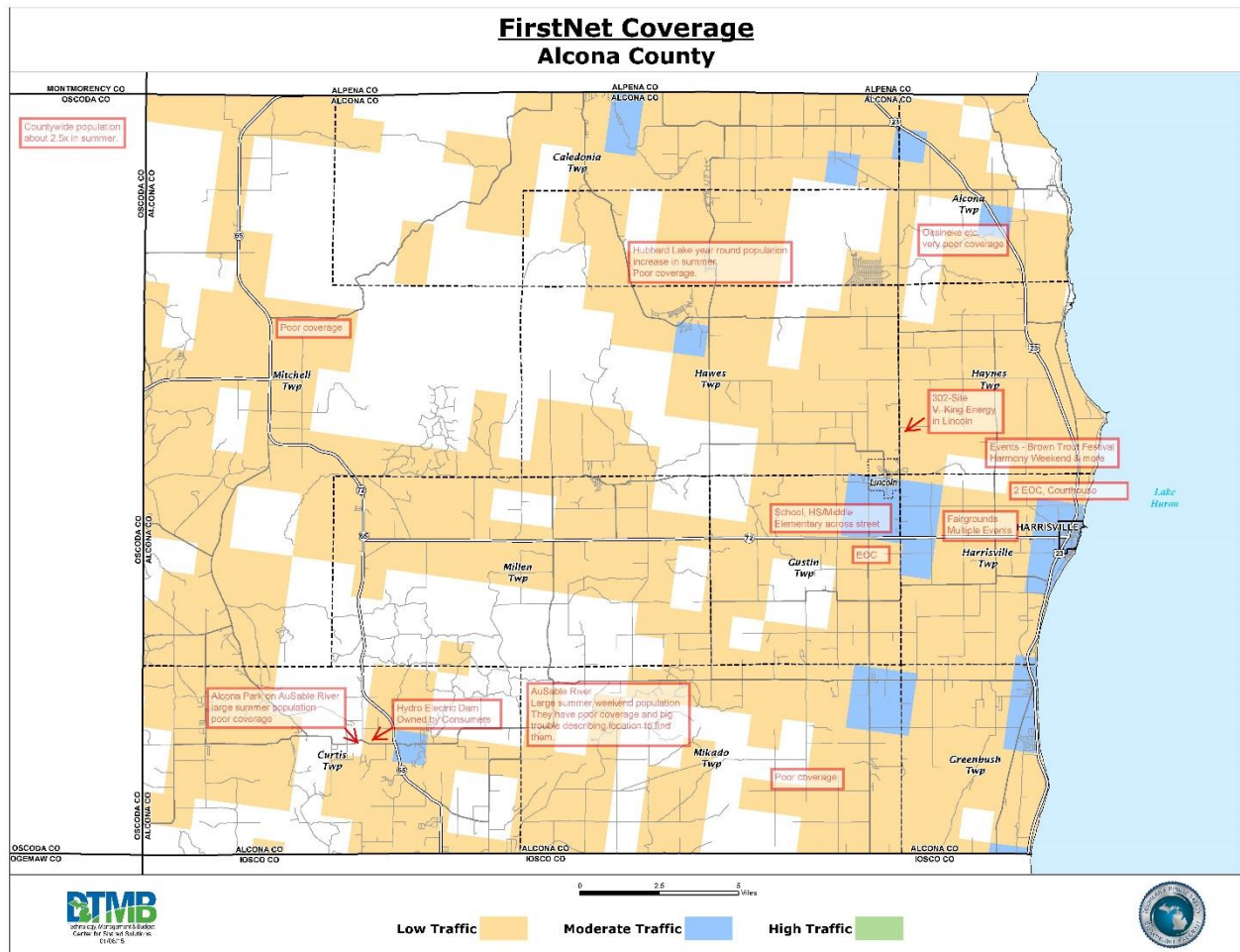
Low Traffic Moderate Traffic High Traffic

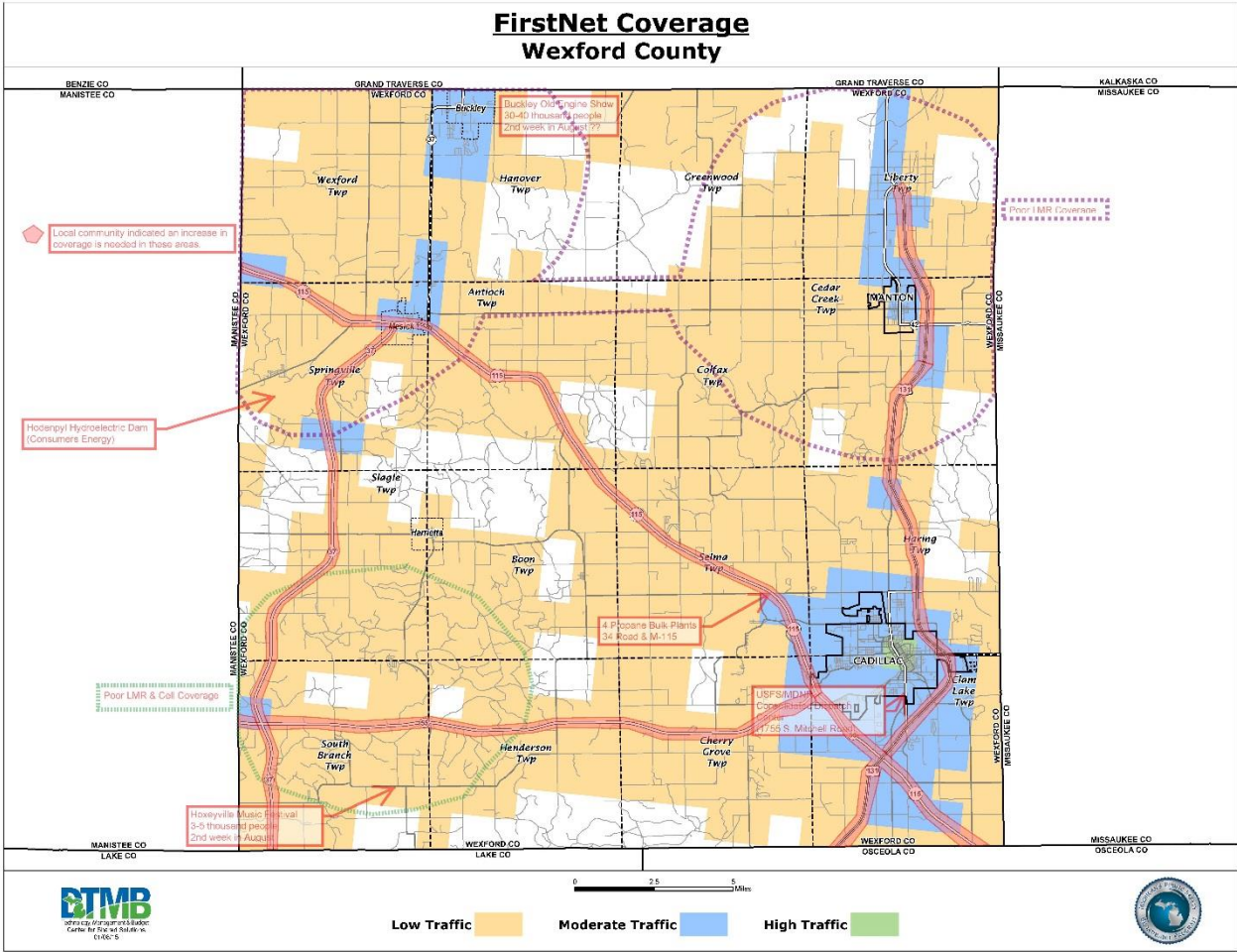


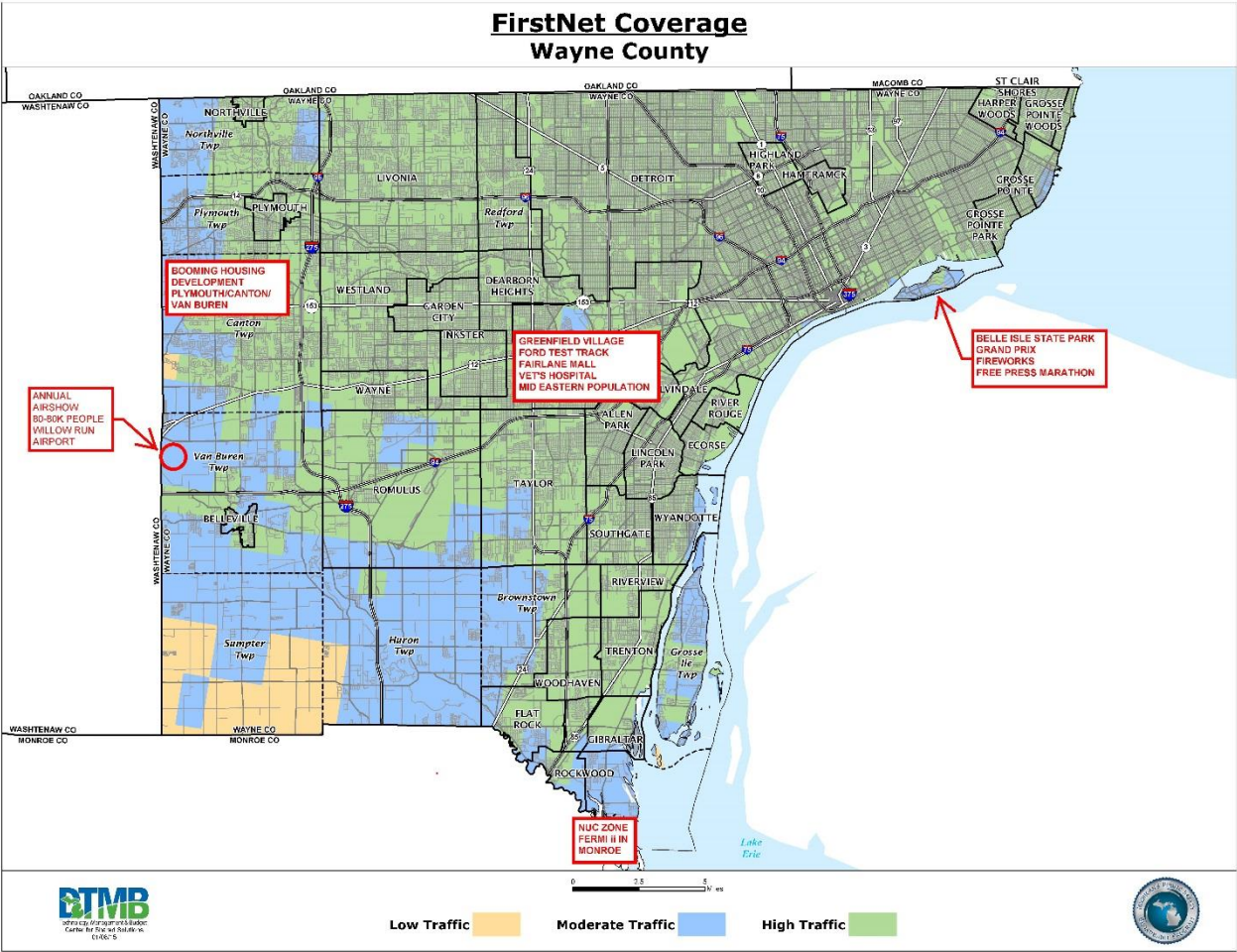


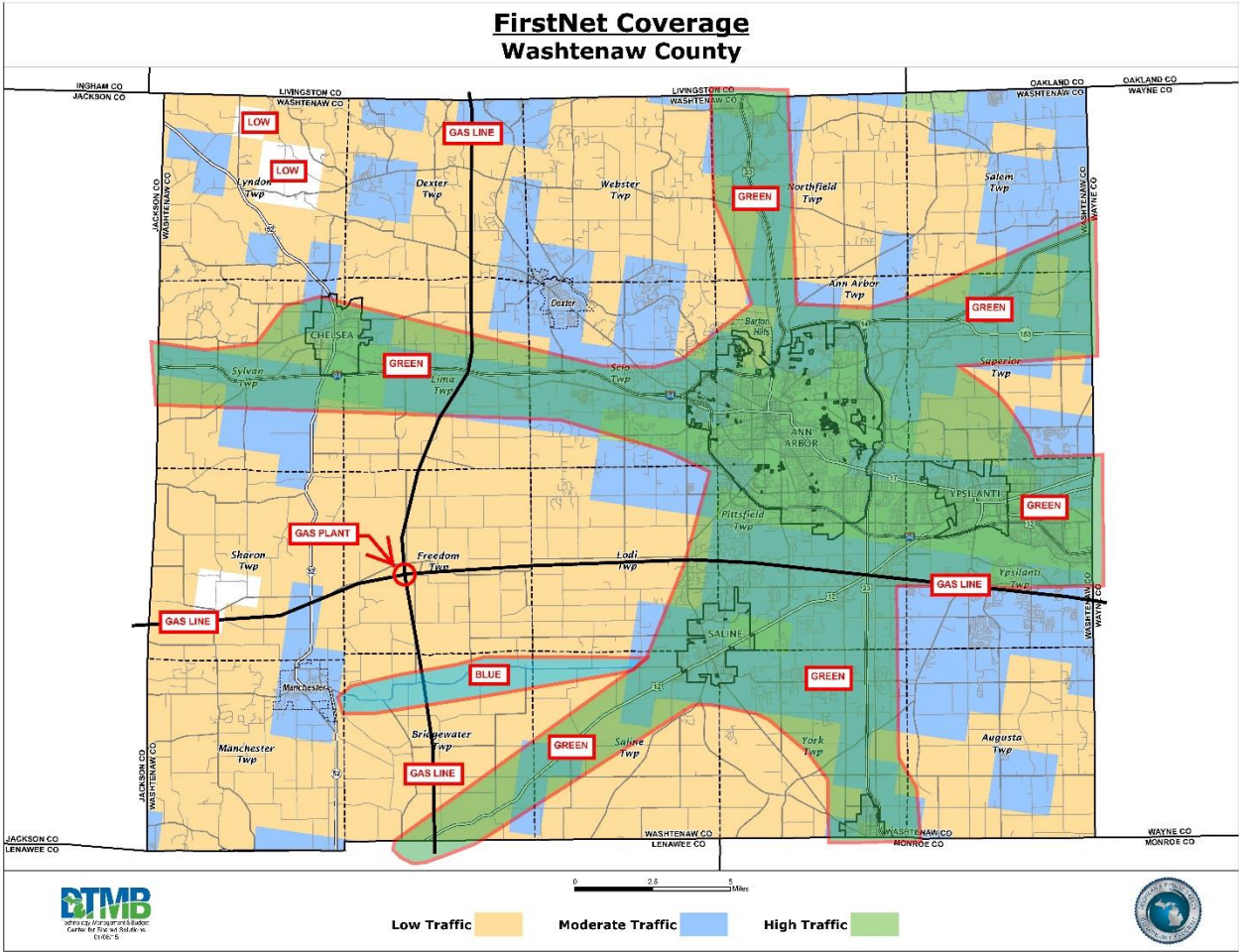


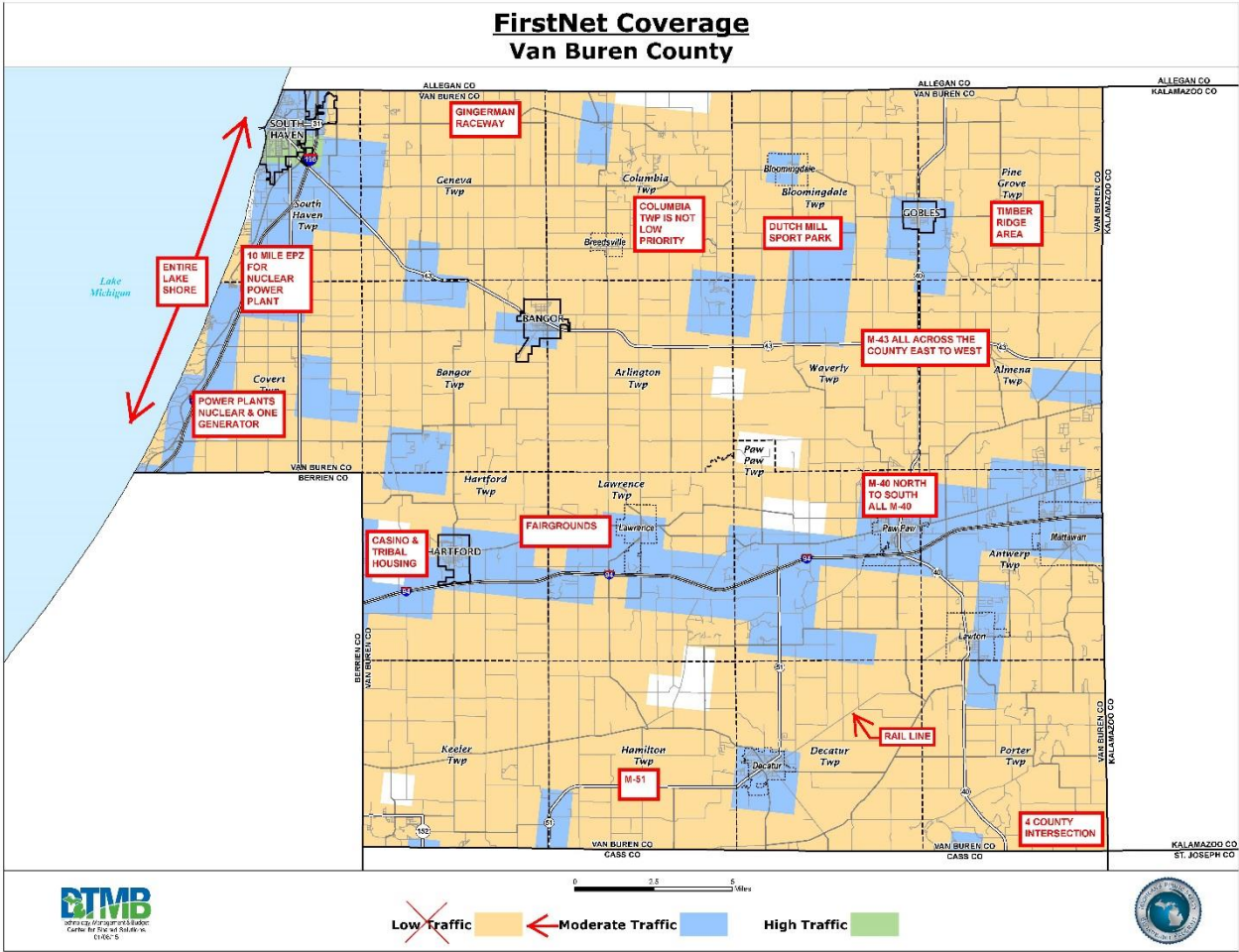






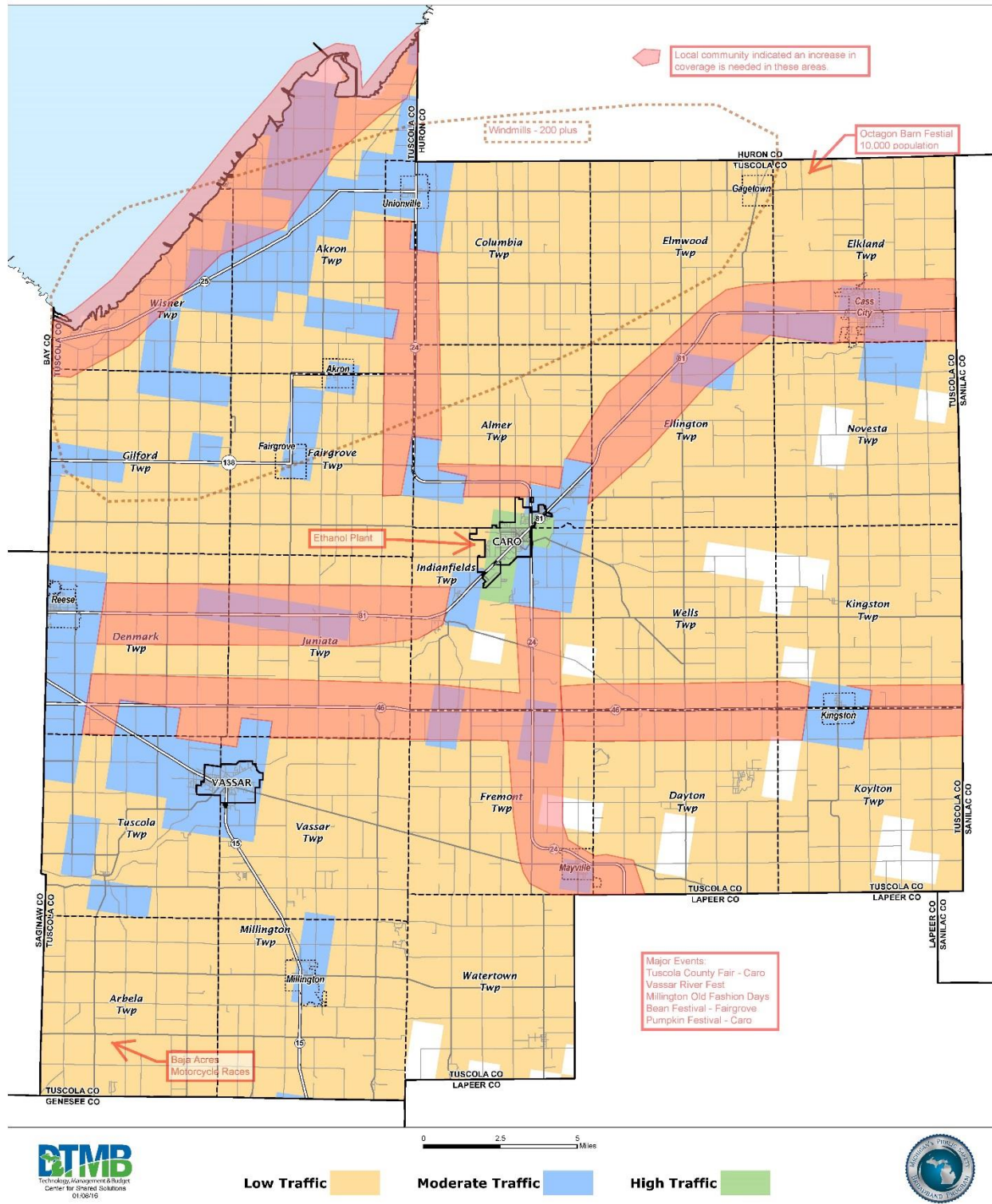








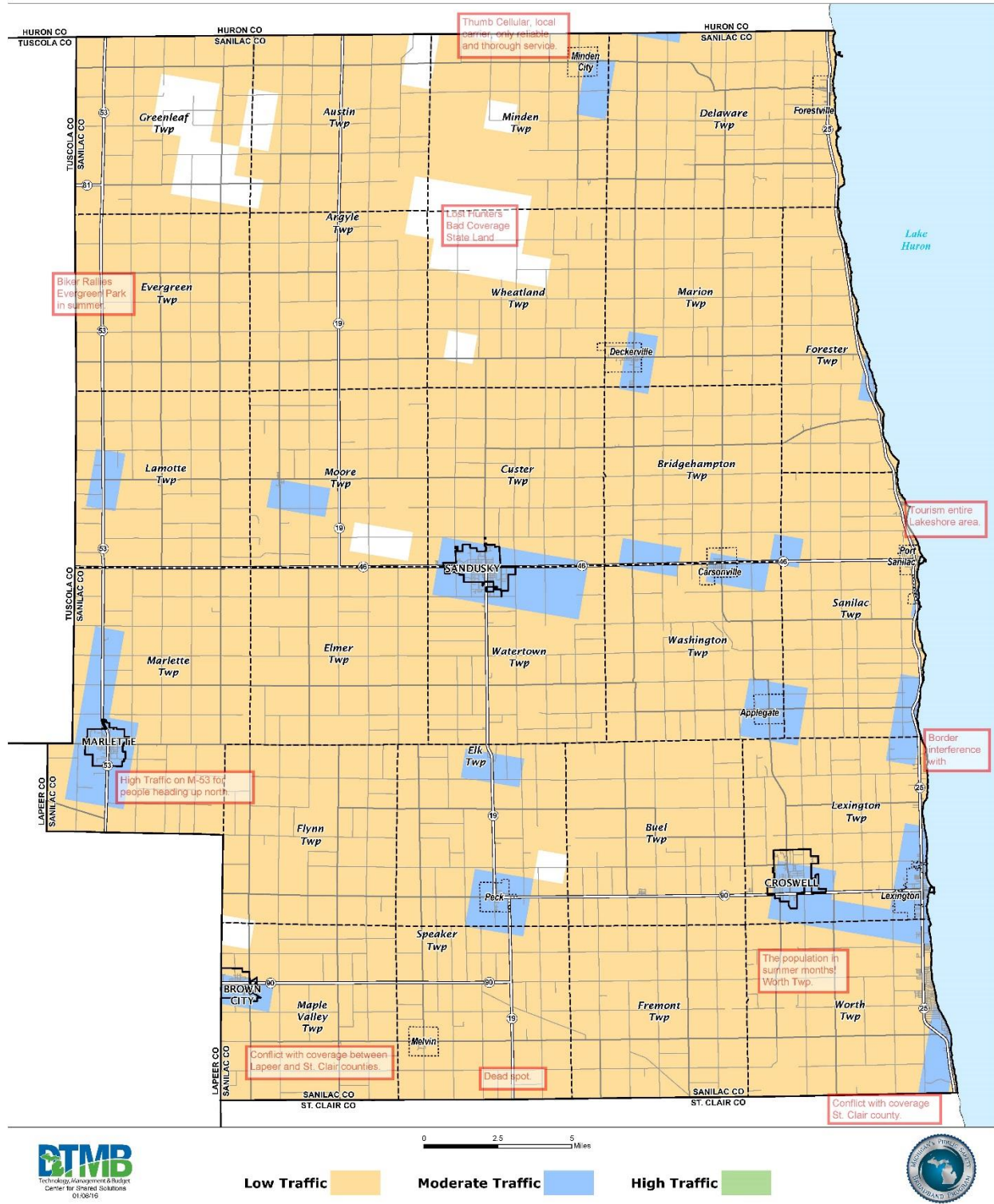
FirstNet Coverage Tuscola County

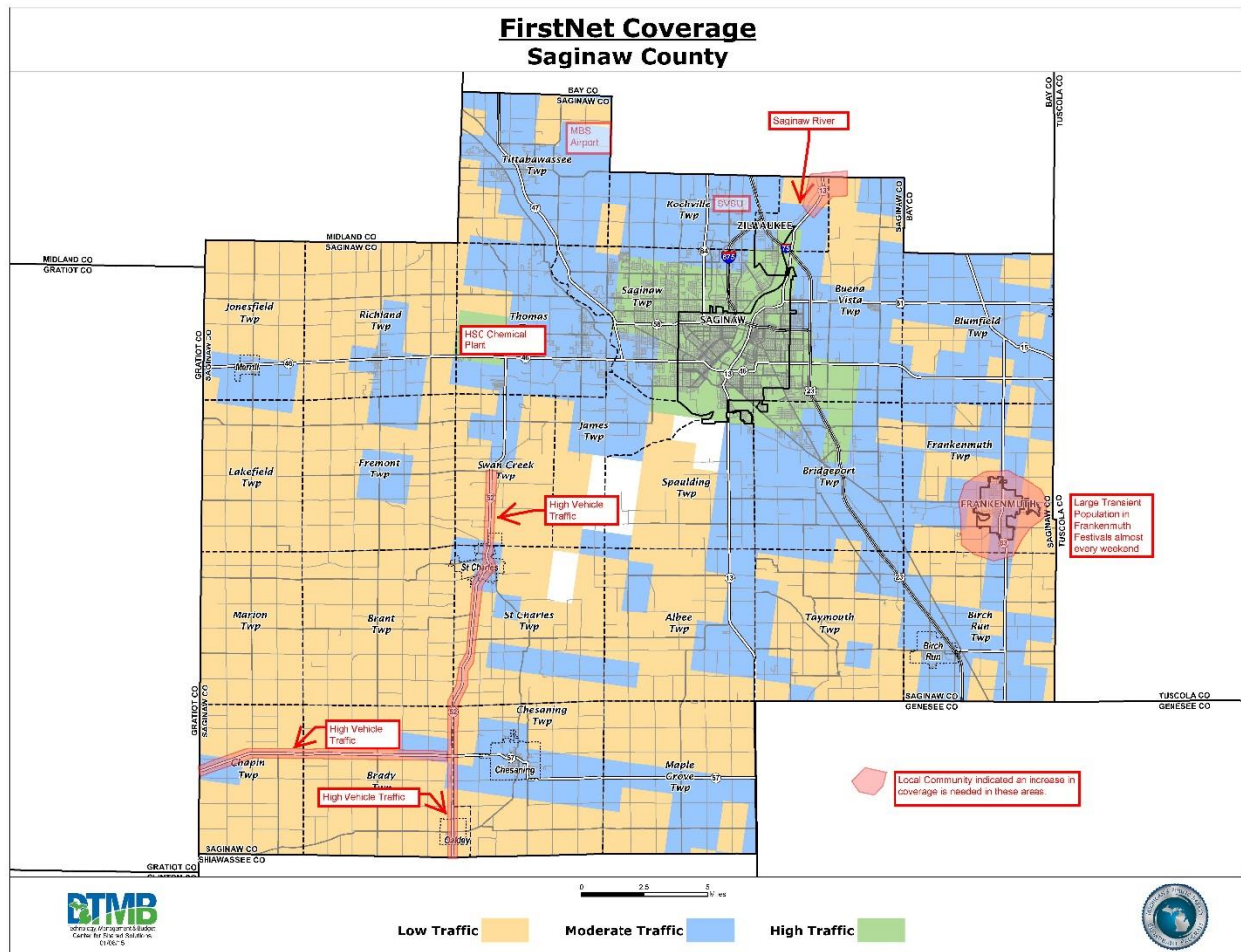


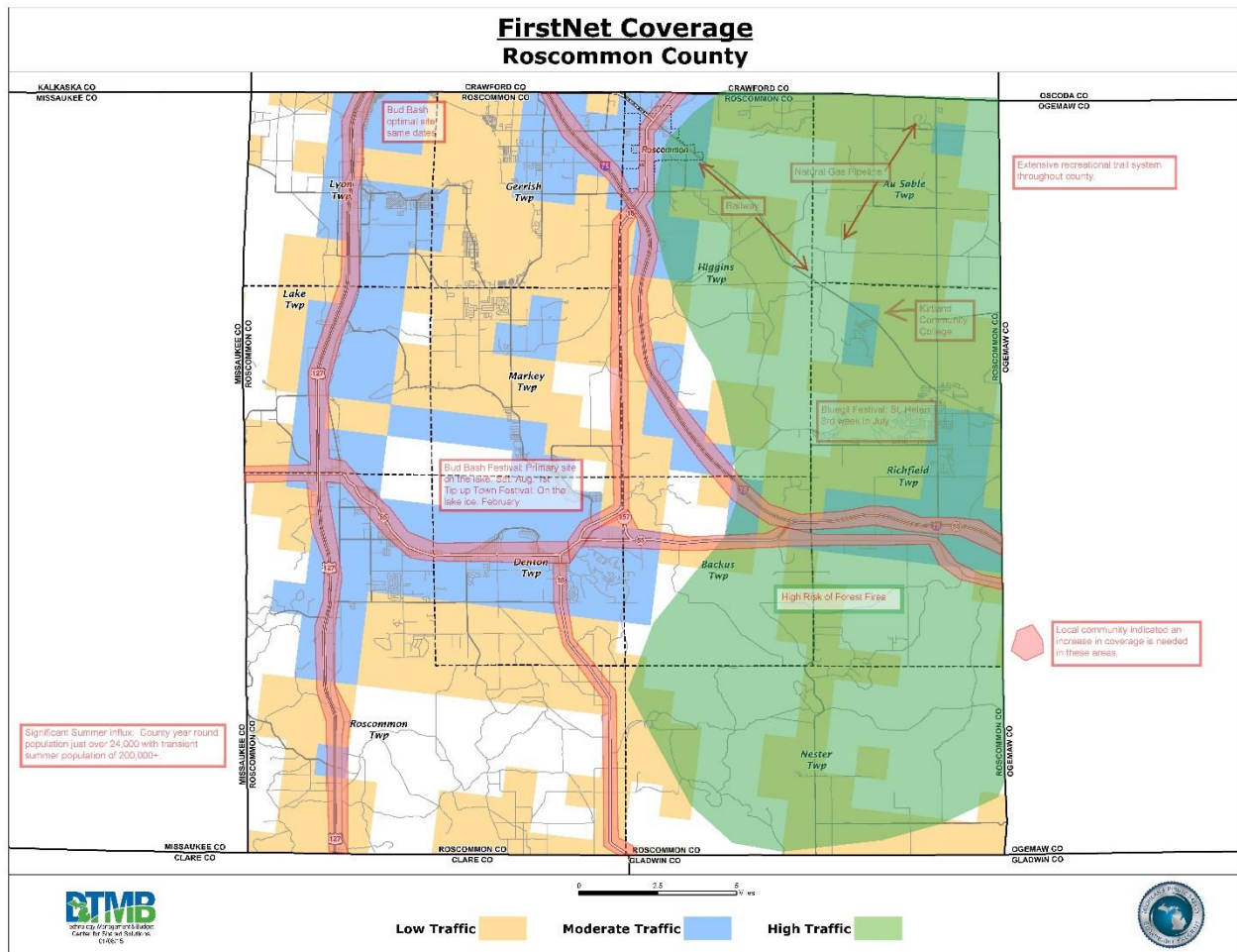
[illegible]

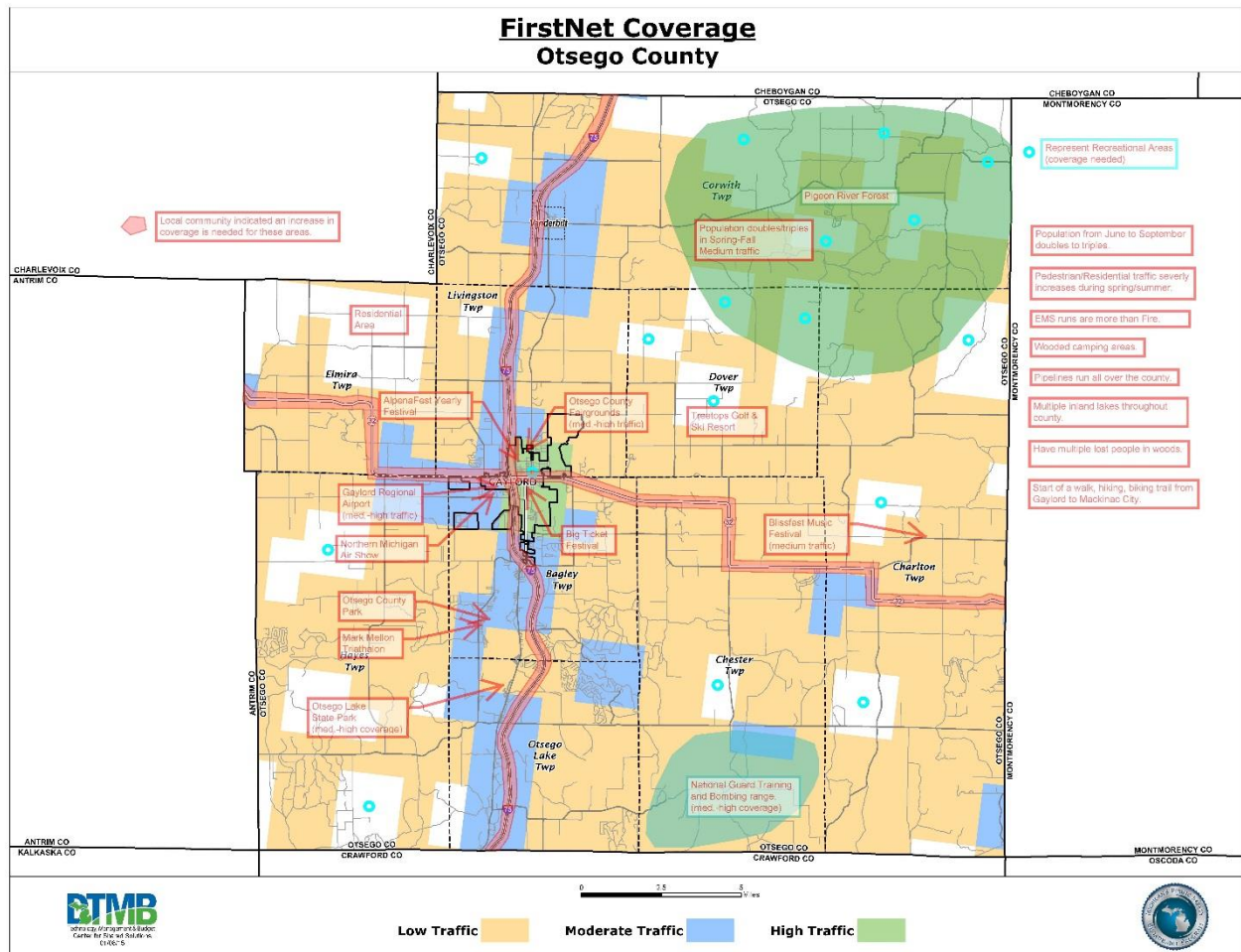


FirstNet Coverage Sanilac County



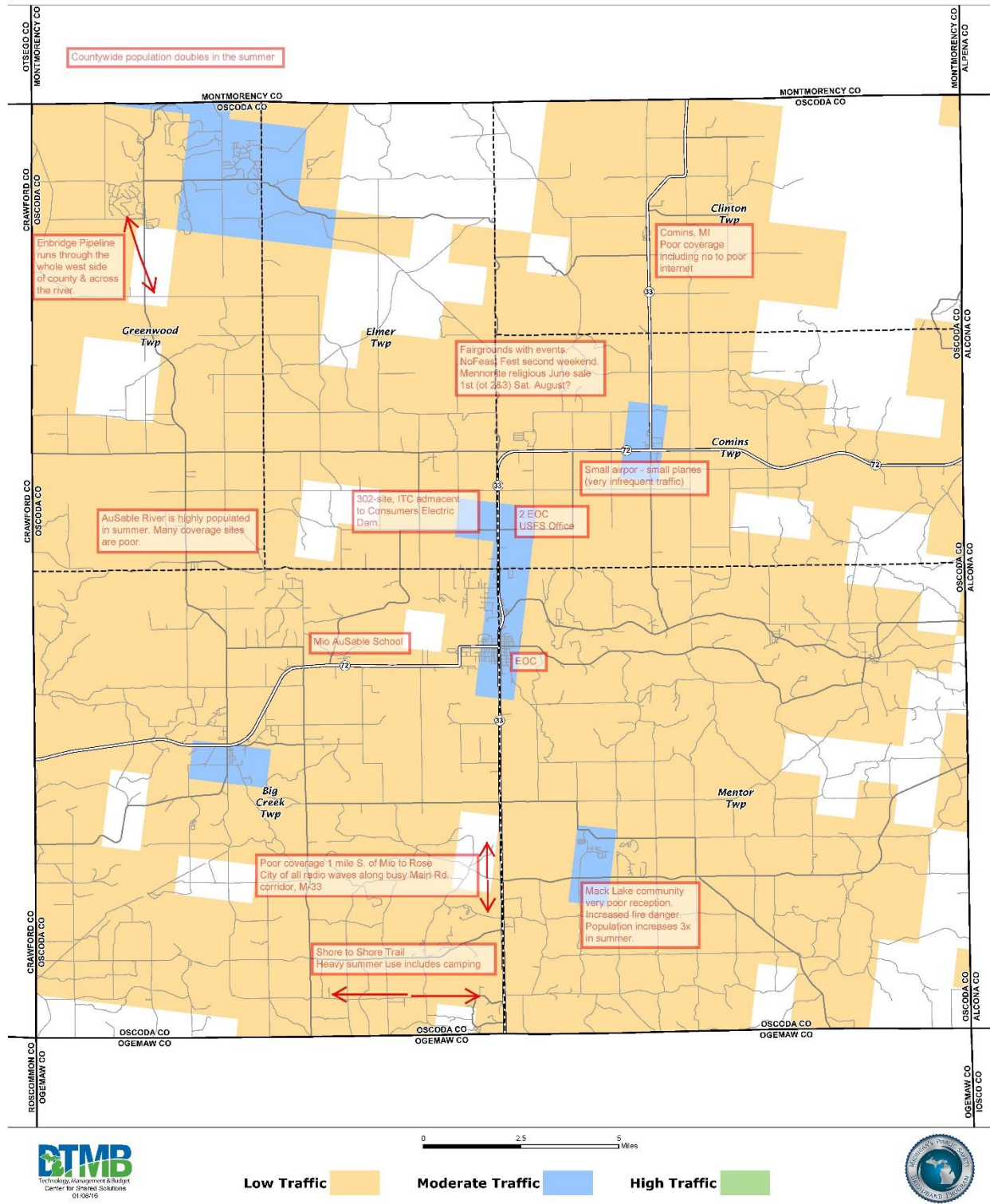


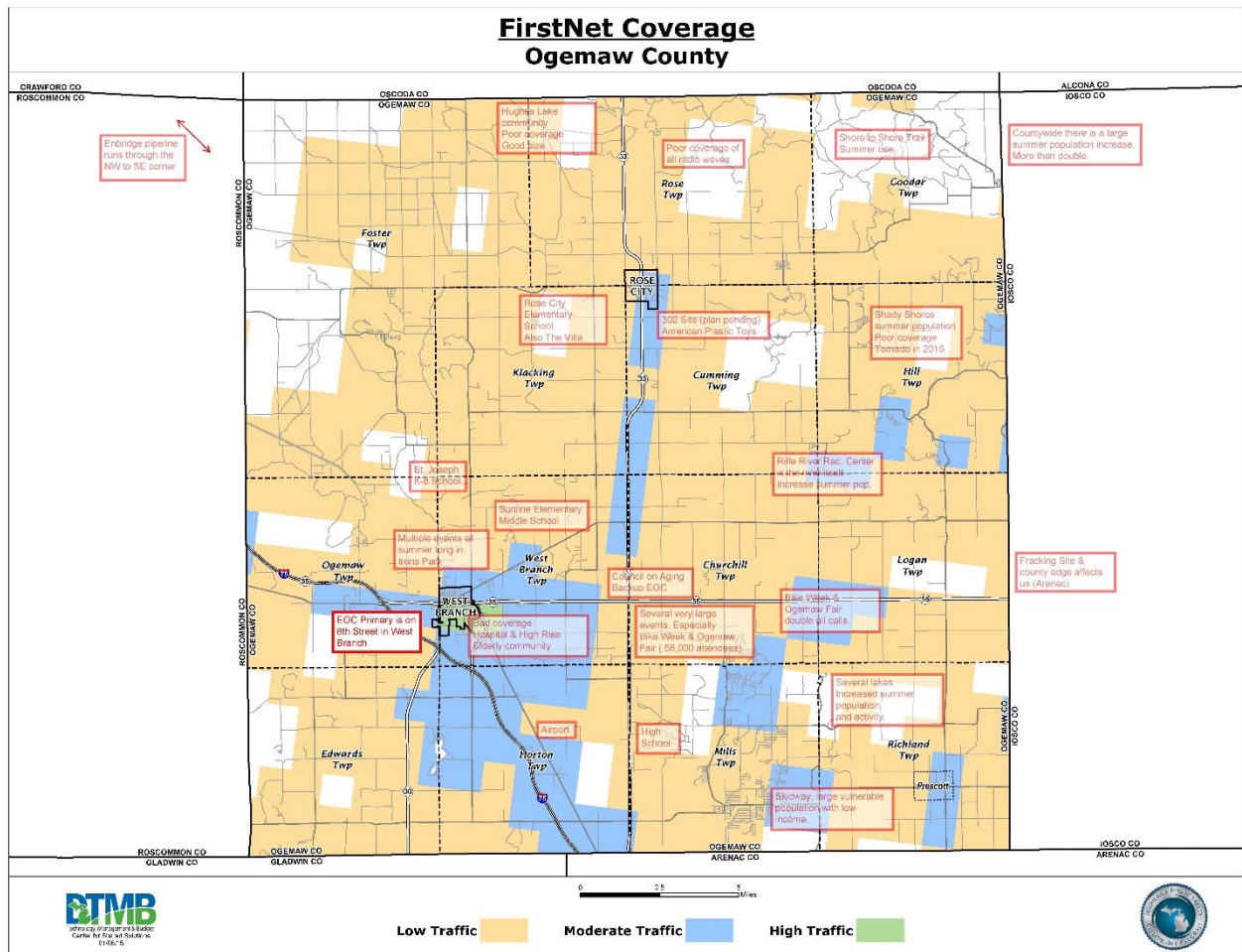






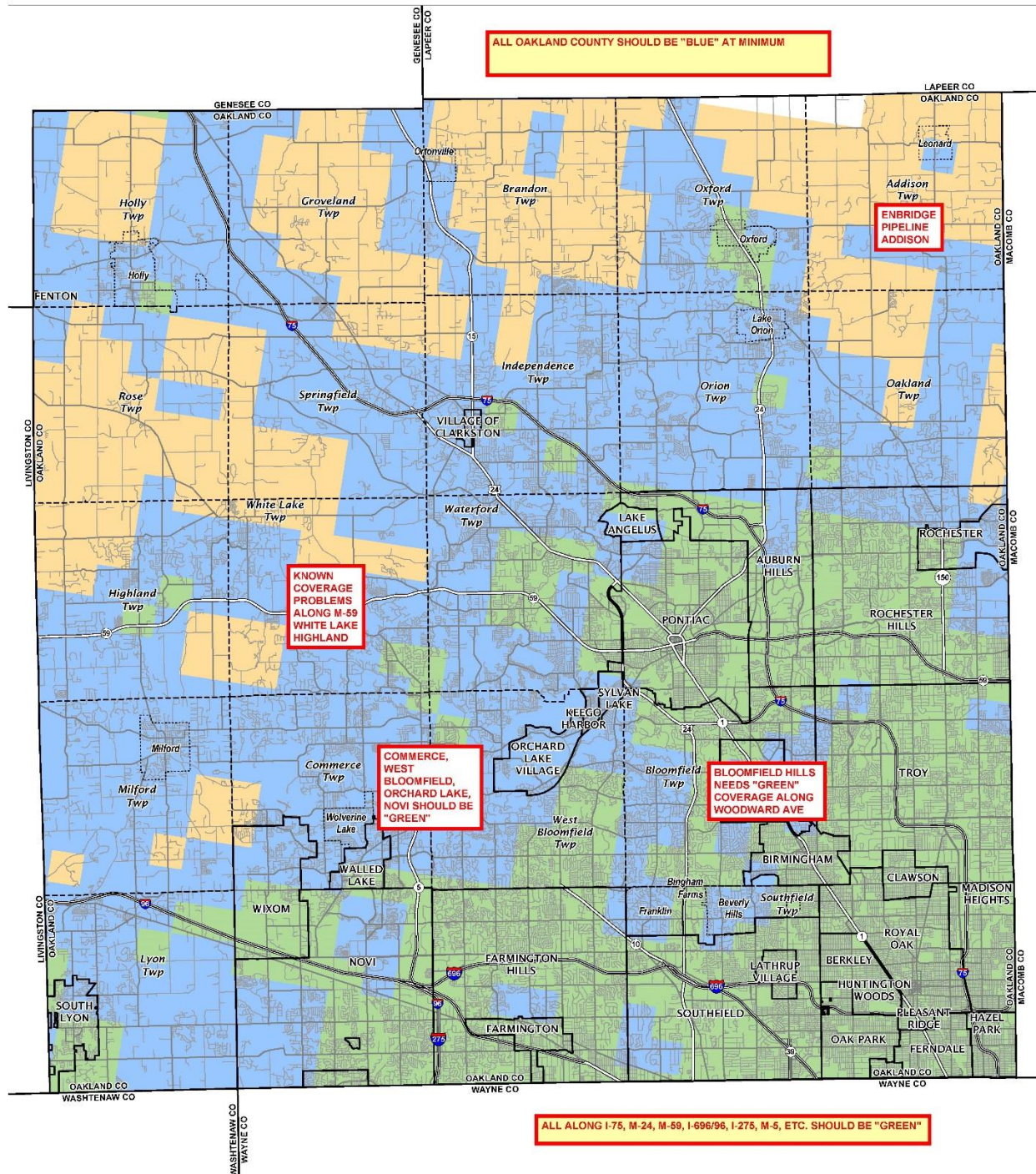
FirstNet Coverage Oscoda County

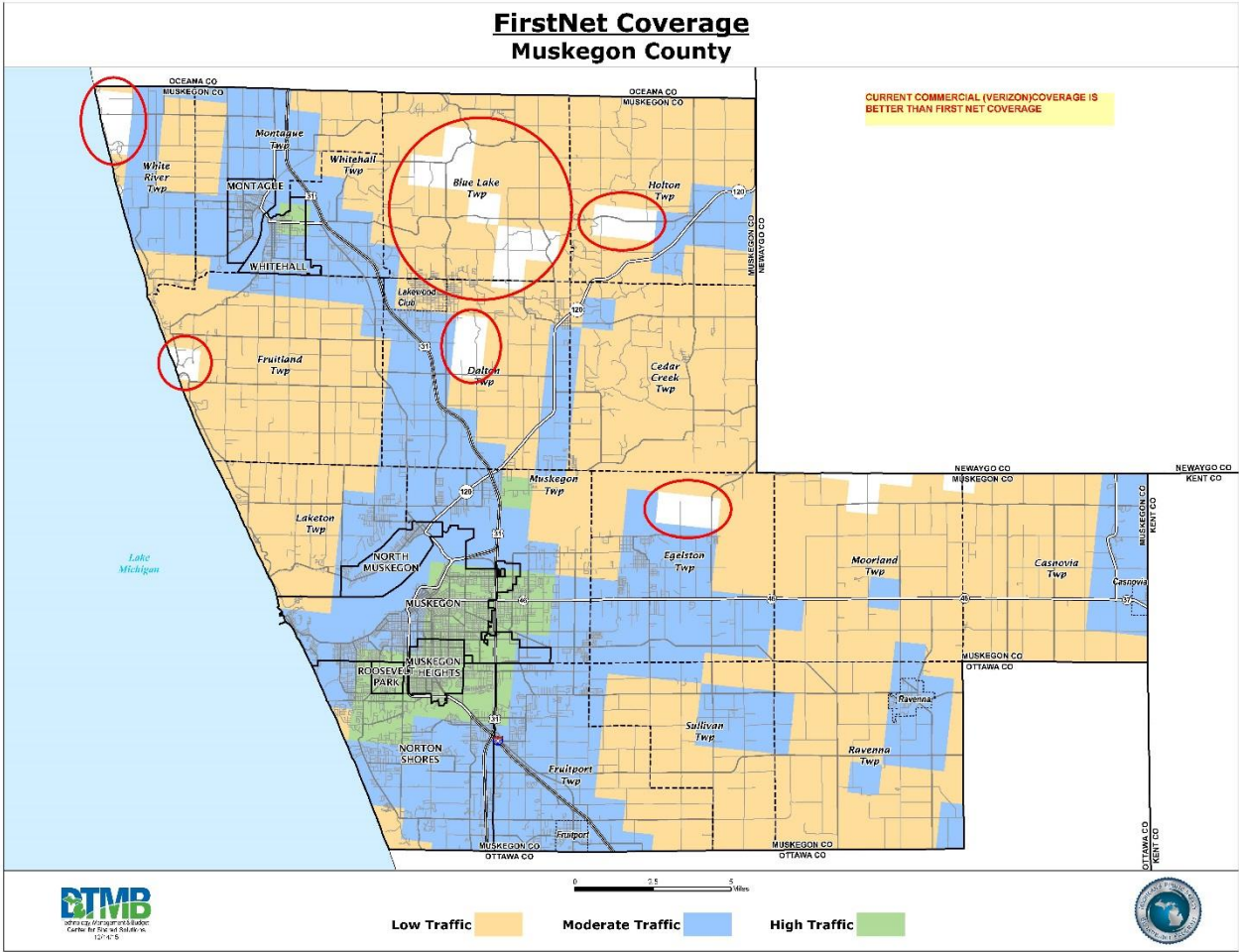


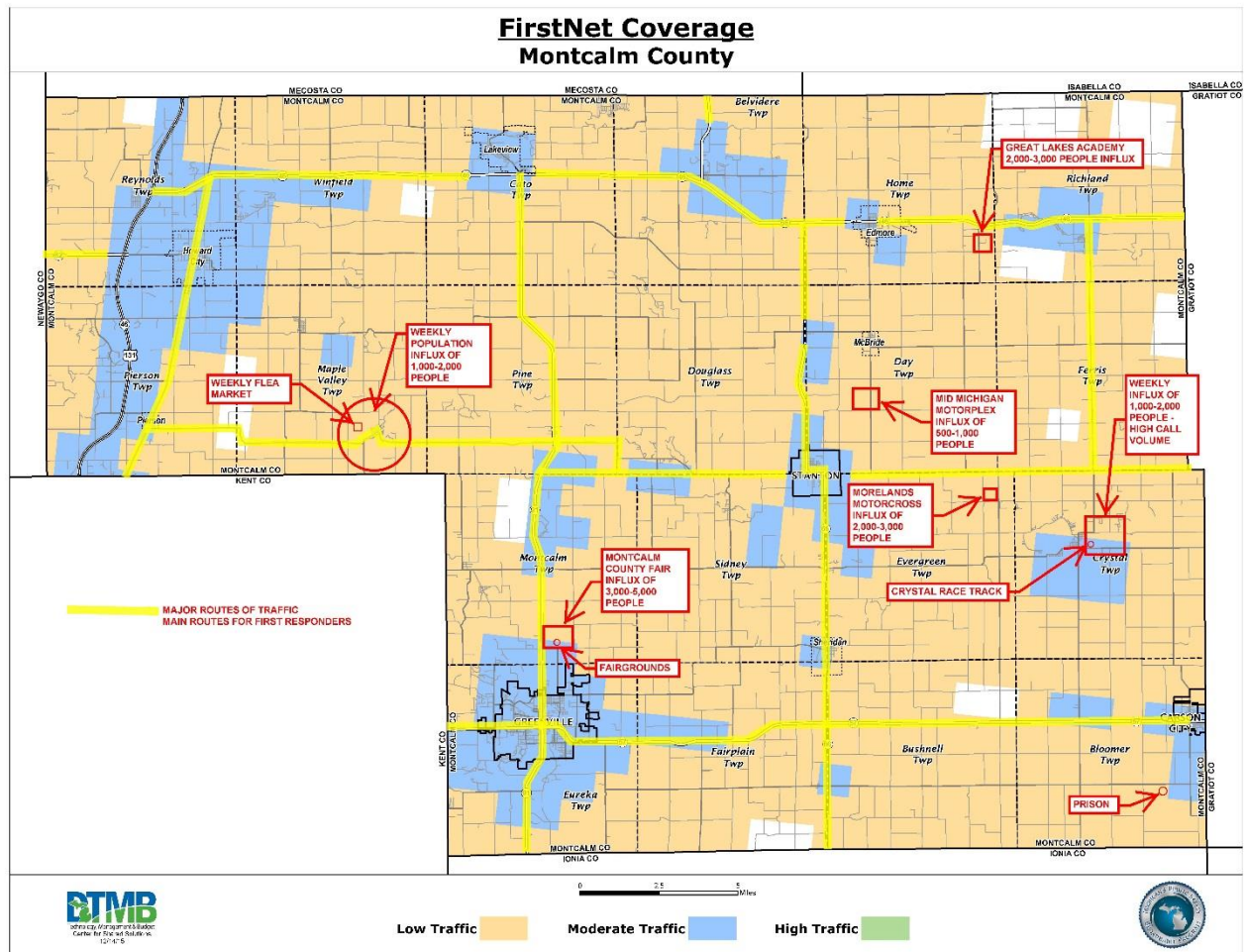


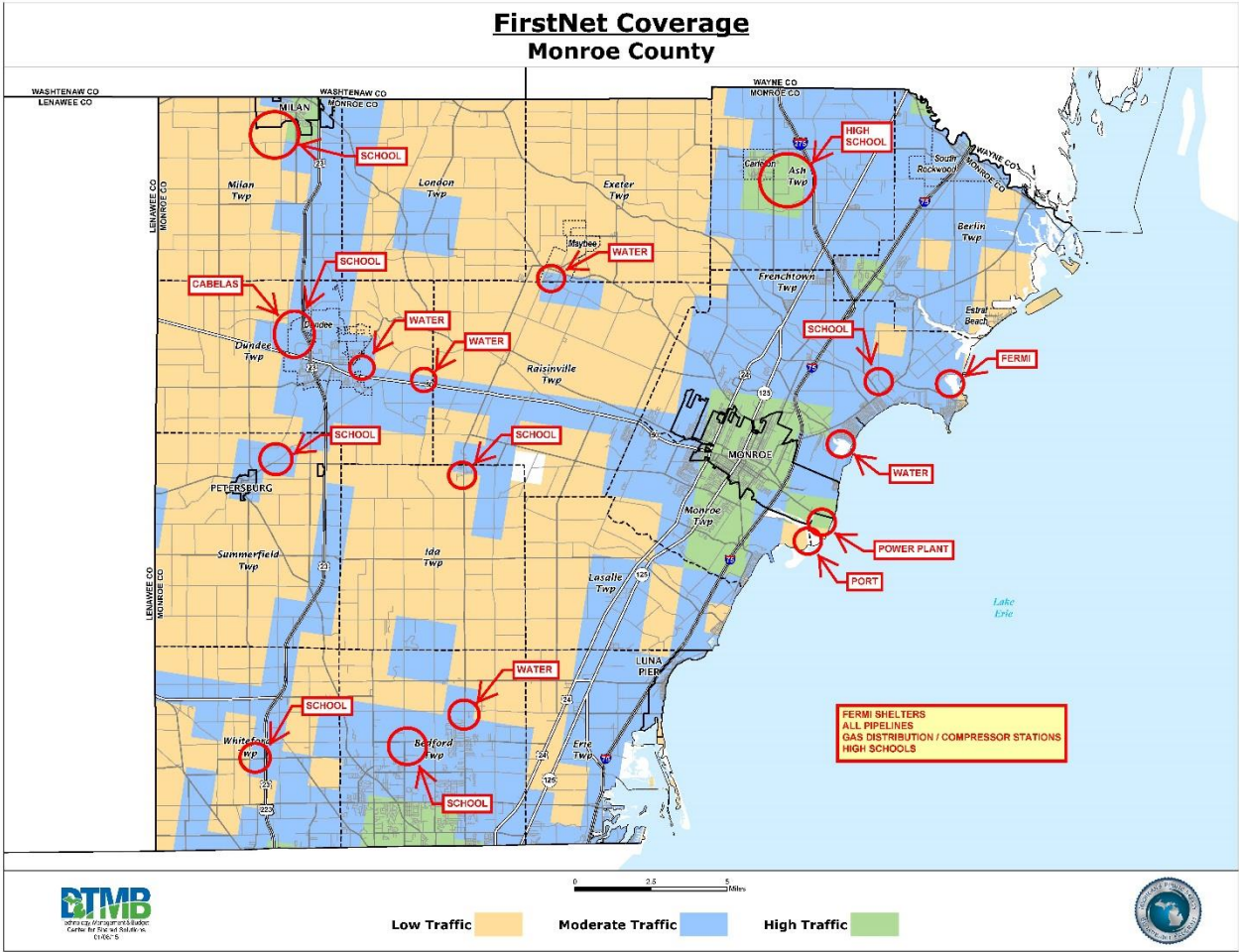


FirstNet Coverage Oakland County











FirstNet Coverage Missaukee County

